THE ILLUSTRATED LONDON NEWS.

SECOND SUPPLEMENT.

VOL. XIX.] SATURDAY, JULY 5, 1851. [GRATIS.

THE GREAT EXHIBITION.

ON DECORATIVE ART.

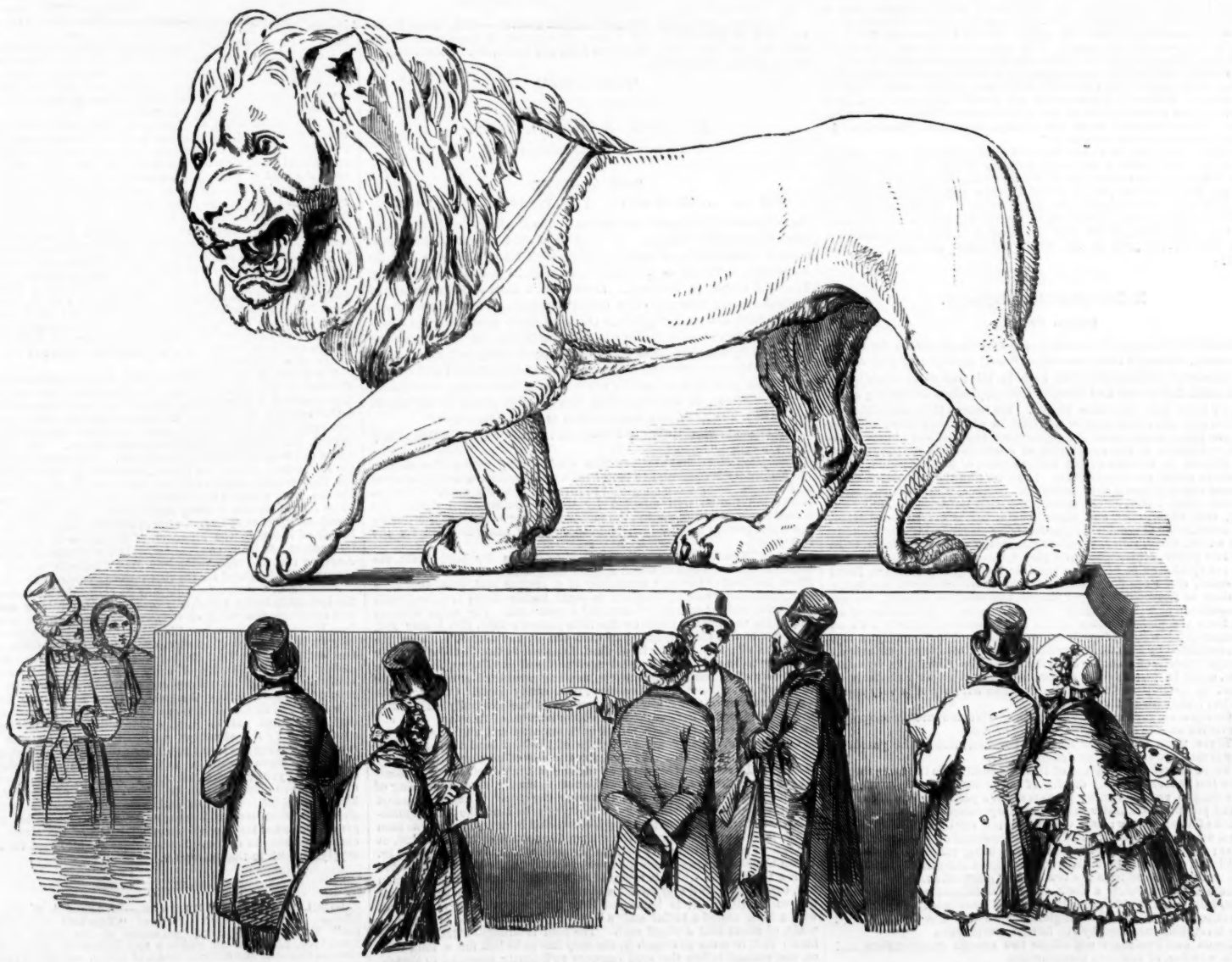
THE ornamentation of works of utility is a subject which, after very long and almost total neglect, is beginning to engage the attention as well of producers as of those who employ them, and which it may be interesting to consider in reference to the examples presented in the Great National Exposition. The subject is a very wide and a very inviting one: we shall endeavour, however, to restrict our observations within the limits of the practical bearings of it. Yet, in doing so, we must not omit to point out what we conceive to be the legitimate province over which such an inquiry might extend, as it involves a necessary relationship, in an æsthetic point of view, of several branches of art hitherto having little connexion with one another, but which, nevertheless, have strictly common interests, in this at least—that for success they must conform themselves to the prevailing taste or prejudices of the age. The rule is imperative—there is no escape from it; and though fine art may pretend to turn its back upon useful art, it is difficult to say where the province of the one begins and that of the other ends; whilst it is positively certain that where fine art has "no connexion" with useful art, like other fine people amongst a non-productive community, its resources become sapped, and it dwindles to decay. What is architecture but building upon principles of taste in which the eye is consulted? the same "taste" which prescribes the form of a hat and the fashion of a sleeve? The chain which connects all the handicrafts employed in the various intermediate matters of social requirement may be a long one, at some points a slight one, but still it is an unbroken one, and will make itself felt sooner or later. As between architecture and internal decoration and furniture the links are very palpable in the recent adoption of mediæval models; where the wood carver and the upholsterer very quickly followed upon the heels of the builder, and where the artificers in silver, and brass, and potter's clay, and now the book-printer and bookbinder (to say nothing of the writer of books) and the embroiderer of silks and woollens, and the whole host of those who minister to the need and fancy of others, are with very great precision following upon the footsteps of one another, or, rather, walking hand in hand over the same path. How long it may be before the tailor and hatter join in the march, and turn us out into *ye streete off Bondde;* "a fine old English gentleman" after the fashion of his forefathers of the thirteenth century, we do not pretend to guess.

There should be a nice and critical scrutiny of the principles of art evinced in every class of works from the highest to the lowest, if we would hope to educate or guide the public taste in these matters. There is no doing things by halves, and fortunately so, as we think; for the same course of culture which brings the judgment to correct appreciation of excellence and beauty in the structure of a palace, will apply equally to the fashion of a dress, and the ornamentation of the material of which it is composed. The same principles of harmony, the same rules of propriety, the same submission to the dictates of common sense and common fitness which regulate the one, regulate the other also. And surely not without justice, surely not ignobly, is art, high art, employed, if, whilst it builds and decorates temples for man's resort, it decorates man also—if, whilst it paints the portraits of our wives and daughters in the most becoming costume, it gives some hint how we may have the originals as advantageously "treated" in that respect when at home.

This brings us at once to a consideration of what has been done towards this art-culture—what has been done towards the accomplishment of this only profitable "Art-Union"—we mean the association of decorative art with art purely useful. We should observe that (speaking of modern times) it is only very recently that the idea of such an association entered into the minds of men: fine art always before that sticking to its picture-frame; useful art to the stocking-frame and the loom. And now that they have consented, as it were, to a conference, with a view to establishing a commercial league, it is not without considerable misgivings, and reserve, and jealousy, resulting from an imperfect understanding of their relative right positions and their common interests, that they go on, or stand still over the matter. The great difficulty at present, as it appears to us, required to be settled, is, where art ends, and where handicraft begins—the middle ground upon which head and hand may work together. In a cabinet picture for the annual exhibition, and in the manufacture of a coarse calico, there is no room for doubt upon this point; it is where the picture and the calico require to be combined. So, in the building of your house, the R.A. is your man to superintend, and take his percentage of commission; but when it comes to the carpeting and furnishing, upon which, as much as upon the actual disposition of the stone-work, the comforts and "effect" of your new mansion depends, he leaves you to the upholsterer and the carpet manufacturer. He will not take commission out of wood-work and woollens. Yet it was not always so—it is not so to the full extent now abroad; and when we all know our own interests better, it will not be so with us. The advantages of a co-operative association of art and handicraft will neither be one-sided nor short-lived. Art will educate and reclaim a larger field in the public mind; will, so to say, create a taste to which it will afterwards profitably minister;—handicraft will, by means of improved and novel designs thus placed at its disposal, be enabled to compete with the markets of the world, from a bold and independent ground, which it does not occupy at present;—finally, the artificers employed in this joint production will have constant opportunities of developing their inventive talents, and of advancing their position beyond that of mere live mechanism; and England, instead of being for ever a mere nation of shopkeepers, may become the art-producer of the world, and the founder of a new school worthy of bearing its name.

For want of this application of inventive and original taste to handicraft, the latter, left unaided and in the dark, has had, through a series of generations, to resort to mere copying of favourite models of former periods—models more or less meritorious in themselves, but whose merit consisted mainly in their originality, and their general conformableness to the prevailing tastes, and the prevailing fashions in other matters, of the time in which they were produced. Thus have we constant boastings of pure *cinque cento*, pure *Rénaissance*, pure Elizabethan, pure Louis Quatorze, and most abundantly of all pure *rococo*, as though these were passports to honour and favour, instead of simple confessions of bankruptcy in idea, and almost hopeless extinction of inventive faculty.

It is now fifteen years since not only the public, but the Government, began to awake to a full appreciation of the miserable state of darkness in which the country lay in respect to all that related to the ornamental



COLOSSAL BAVARIAN LION

COLOSSAL LION.—MÜLLER.

THE monster of the forest stands 15 feet from the head to the tail, and 9 feet high. Having said which, there remains little more to be added, save that it stands in the Eastern Nave, courting the gaze of all who are curious in lion-flesh. For the animal itself, with many thanks for this contribution—all the way from Munich—we must say that we have many better lions in this country, the noble beast at the top of Northumberland House, for instance, whose erect bearing might be studied with advantage by the Bavarian sculptor. There is, or used to be, also, a brass lion at the corner of Berners-street and Oxford-street, which we consider superior in many points to M. Müller's. Upon the whole, despite the acknowledged taste of the late King, and the attention and money bestowed by him for the encouragement of art, Bavaria does not figure very favourably in this respect in the Great Exhibition of 1851.

part of manufacture—a circumstance which it was proved militated very seriously against the commercial prosperity which we are otherwise entitled to enjoy; and seeing the hopelessness of a spontaneous movement on the part of high art in aid of its humbler brother, it was resolved to establish Schools of Design, with a view to affording elementary instruction in the arts applicable to the decoration of manufactures, &c. The establishment of the Government School was quickly followed by that of others, some subsidiary, others independent, in various parts of the country. What the result of these efforts has been, may be gathered by those who take interest in the advancement of their kind, by inspecting the exhibitions of works of students which annually take place; for, as yet, we are sorry to say, there has been little direct effect upon actual manufactured productions.

In simple truth, the school of design system, considered in reference to what was expected from it and what has been done for it, has proved a failure. The cause of this failure has been much and angrily discussed by several parties who have been more or less mixed up or interested in the scheme; but, upon a calm revision of the whole case, we think it may be summed up in very few words: *first*, the schools of design have been too limited in the field over which their influence was proposed to extend, being restricted chiefly to the manufactures in which patterns are artificially multiplied, and not touching the higher branches of decorative production, such as architectural design, wood-carving, room-furnishing, &c., to which textile manufactures are but tributary; *secondly*, the instruction has for the most part been limited to mere copying, whether by drawing or modeling, of actual objects, whether natural or manufactured, no attempt having been made to inculcate the principles of design, as design, much less to encourage the inventive powers and educate the tastes of the pupils: the consequence is, *thirdly*, that the latter having been left to their own devices, with their mere acquired faculty of imitating actual objects, without any sound principles as to the selection and disposition of those objects for decorative purposes, having regard to their respective fitness as embellishments of various classes of productions to which decoration may be applied, have (with few and trivial exceptions) failed of producing anything which has proved worthy of practical adoption by our manufacturers; so that, whilst they themselves have but little advanced their stations and prospects by years of study, the manufacturing taste of the country is just where it was before the scheme was started.

We have too much reason to apprehend that this unpropitious state of things is in part attributable to the very men who would be most benefited by an opposite result; that the textile manufacturers, with whom the concoction and plagiary of patterns has always been a sort of mystery, have viewed with jealousy the attempt to educate pattern drawers by scores in every manufacturing town in the country. They see in all this, abundant means of competition, but none of advancement; and knowing that art, as involved in design and colour, can only be successfully applied to manufactures by one who understands the technical details of the latter, in whatever branch it may happen to be, they have too generally refused to give their aid to the general cause by enlightening their students of art in the mysteries of their handicraft. Mr. Thomson, of Clitheroe, in his evidence before a committee of the House of Commons, indeed, very clearly lays down the views which manufacturers have commonly entertained upon this subject, and we quote a passage from his evidence, the more readily as the committee in their report particularly refer to this witness, as "a gentleman of great taste and experience in manufactures." Mr. Thomson says:—

"The manufacturers of England want educated designers; and they look to your schools for that instruction to our young men which will train the eye to an accurate perception of beauty, and form, and harmony of colour, and the hand to the correct delineation of it, and thus lay the most solid foundation for the application of design to that branch of industrial art in which the student decides afterwards to engage. In six months they will learn more technical skill relative to their own art in our workshops and manufactories, than you could teach them in six years at Somerset House. Besides, who is to teach them? Are you to have a master or professor of pattern drawing in every department of industry? for calico-printing and its subdivisions furnitures, shawls, dresses? for silk-weaving in its subdivisions of rich damask furniture for kings and princes, dresses for the refined and the vulgar, and a hundred articles of fluctuating fashions in scarfs, shawls, ribbons, &c.? Where will you find the universal genius that is to teach all this? or will you have a master for each? You will advertise, and your small salary will bring you hosts of broken-down pattern-drawers of all sorts, who, though unable to get employment in a manufactory, or find a sale for their own designs, will yet boldly undertake to teach everything in your school. Beware how you excite the doubts and suspicions, and eventually lose the confidence of the manufacturers themselves, by failing, as you assuredly will do, in the attempt to do that which it is impossible you should ever succeed in."

Although it is two or three years since the above observations were made, we have reason to believe that they correctly describe the opinions and views of the great bulk of the manufacturers of this country, at the present moment, who have not yet got rid of all their apprehensions and misgivings about pattern-drawing and art movement. If the concourse of genius and industry now going on in the Crystal Palace does no more than rub away a little of this rust of prejudice, it will have achieved a great and certain good to the whole industrial community of this country.

HOROLOGICAL SECTION.

(THIRD NOTICE.)

We proceed to examine the contents of the fourth counter in the British department, reckoning from the eastern "wall space," and find one of the most useful contributions (No. 124), in this part of the Exhibition, from Messrs. Rotherham and Sons, of Coventry, whose interesting workshops we have more than once visited. We believe their establishment to be the only one of the kind in England, in which machinery impelled by steam power is employed for performing many of the almost innumerable processes in the completion of a watch. The contribution we have alluded to consists of the various parts of a lever watch, in the progressive stages of manufacture. Thus we find the top plates, pillar plate and cap, cap spring cock, name bar, potence, wheel bar, regulator, pendulum, stud, detent, detent spring, stop, stop spring, index, bolt, bolt-spring, dial wheel, click and rachet chain, barrel cover, barrel arbor, fusee, collet, main or great wheel, maintaining power spring, maintaining power wheel, fuzee, roller, lever pallet, escape wheel and pinion, third wheel and pinion, centre wheel and pinion, compensation balance; then there are specimens of very fine pendulum springs, ruby stones, jewel holes, cases, and rings for glasses. All the above are shown as roughly cast, then as formed into proper shapes, and lastly as finished. Several movements are also shown, and a beautiful display of 137 watches of all kinds, from the plainest silver watch to the most elaborately finished and ornamental watch of gold. It would be well if the analysis of a watch, exhibited by Messrs. Rotherham, as also the various escapements and large models of watches contributed to the Exhibition by other makers, could be permanently deposited in some proper receptacle in London, as forming an illustrative exhibition not only of a very interesting but highly instructive character.

80. On the same counter, Mr. Thompson exhibits his auto-chronograph, for the instantaneous stamping or printing of time.

36. Three plain watches in front of pouches, intended for guards of railway trains, are exhibited by Joseph Fairer.

55. From the celebrated house of Dent, in addition to the large turret-clock in the nave, is a goodly display of chronometers and watches, of various designs and for various purposes. We particularly noticed his improved patent chronometer, with secondary compensation to correct extremes of temperature; and with varnished steel balance spring, a common marine chronometer, and a second example of his patent chronometer; but, instead of the balance-spring being varnished, it is gilt.

64. Eleven gold and three silver watches, good samples of Mr. Jones' manufacture suspended from the branches of a metallic tree.

William Turner exhibits a clock showing simultaneously the time in London, Edinburgh, Dublin, and Paris. This description of horological contrivance is not confined to England, as we have already mentioned similar inventions exhibited by our foreign competitors.

Parkinson and Frodsham contribute two marine chronometers, and ten gold watches, of first-rate manufacture.

68. Charles Mac Dowall's patent single pin dead escapement, in plain case, is on the same counter, and also numerous horological specimens exhibited by Charles Frodsham, of the Strand, including marine chronometers, gold pocket-chronometers and lever watches double rotary escapement, day of the month watch; gold lever watches with split centre, second's hand movement, railway watches; English pinions for astronomical clocks, carriage clocks, portable chime clock, chronometer and watch movements, diagrams of calibres of chronometers and watches; gauges for admeasurement of watchwork to the thousandth of an inch, specimens of gold watch-cases, and the new calibre.

106. W. J. Evans exhibits one small and three large skeleton timepieces: the design of one of the latter represents the monument of the late Sir Walter Scott. Adjoining the above are shown an octagon-shaped hall clock, with quarter-seconds, and a second clock with radiated gilt face.

117. John Page, of Bury St. Edmund's, exhibits a fine skeleton clock 28 inches in height, which requires only *once winding* in *three years*. The power is obtained by six springs of the united force of 250lb., which are enclosed within as many brass barrels; three of the springs are connected by chains to a fusee on the right hand, and three on the left hand. The power is thus concentrated in the pinion of the second great wheel, and is conveyed up the train of wheels and pinions to the pallets which are connected with the pendulum, the power being reduced to that of a few grains; yet it is sufficient to keep the pendulum in constant motion. After the clock is first wound up, the chain is unwound from the smallest part of the fuzee, three turns of which allow the barrel to revolve once in 210 days. This is believed to be the *slowest motion ever produced*. By this clock, the day of the month and the number of weeks and years during the time it has been going are registered. A spirit-level is attached to the base, so that the clock may be placed for certainty in a vertical position.

Mr. Page also exhibits a pyramidal-formed skeleton timepiece, 28 inches high, which goes three months with only once winding. The hour-dial is placed at bottom, in order to display the wheels in motion. It has Graham's dead-beat escapement. The hands are moved by novel but simple mechanism.

71. Lucien Marchand contributes thirty-five watches of various designs and constructions, as also a curious musical clock, which requires winding only once in a month. It has independent seconds. On one side is a magician with a wand, who, at certain intervals, rises from his seat and points to an answer to any of twelve set questions which may be proposed—the whole being arranged in connection with the clockwork. On the other side is a bird perched on a tree, which sings at certain intervals. The music is from four popular overtures.

Parkinson and Frodsham, in addition to the articles already mentioned, exhibit a table-clock of very ornamental design.

J. Driver, of Wakefield, exhibits a handsome skeleton clock, which strikes on eight bells, and is supported by four lions made of terra cotta. By this clock, the time in any part of the world may be ascertained at pleasure.

104. A large transparent skeleton spring timepiece is contributed by J. Edwards, of Stourbridge. Some of the wheels are constructed of brass and glass connected together—quite a novelty in horology.

John Donegan, of Dublin, exhibits twelve gold and twelve silver watches, of neat design.

158. G. Lovejoy, of Reading, contributes a twenty-one days timepiece, with "invisible mechanism."

155. Sanders Trotman has a novelty in the shape of a "Night-lamp Time-indicator." The regular consumption of camphine is the power employed to indicate, by means of an index, the time of night.

A clock of Egyptian design, with a a sphynx at the top, is exhibited by Thomas Adams, of Lombard-street.

37. P. Robinson, of Bishop Auckland, exhibits a skeleton clock, striking on three bells: the design is that of the clock-tower of the Bishop of Durham.

C. Hinton has sent specimens of English hard white enamelled watch faces.

131. J. Young, of Knaresborough, a small skeleton clock, striking on one bell.

113. Watch and clock fuzee chain and hook, exhibited by W. Hare, of Christ Church, Hants.

103. A portable spring time-keeper, requiring only once winding up in 426 days; manufactured by J. T. Edwards, of Dudley.

"*Ne sutor ultra crepidam*" has not been attended to by "*A working shoemaker* resident in London," who has invented, designed, and made a 32-day skeleton timepiece, with detached escapement, having fewer works within than usual. Surely this person ought to be encouraged in the more philosophical business which he has entered on.

J. Kaisir contributes a plain table-clock.

81. Messrs. Pettit and Trappett exhibit a silver watch, which is suspended in a globe filled with water. The object of the invention, the exhibitors say, is to secure the works from sea water, &c. This is the last article on the fourth table.

(To be continued.)

BRITISH AGRICULTURE.

BY THOMAS ROWLANDSON, F.G.S.

PART XI.—KENT.

Area .. .. 972,340 acres | Population 548,337

THREE sides of this county are washed by the sea, including in that term the estuary of the Thames. It may be classed as one of the metropolitan counties, the borough of Greenwich being situate within its boundaries. Taken as a whole, Kent may be pronounced the most beautiful county in England. It also has a more varied character of general farming than any other county, being famed for its hops, wheat, sheep, fruit, and market produce (such as green peas, &c.) In consequence of its generally fertile character, added to the high manuring practised by the farmers of this district, particularly in the neighbourhood of the metropolis, and for which its extended seaboard and vicinity to London gives such favourable circumstances for its cheap conveyance, it may, perhaps, be safely asserted that no other county of like extent makes such a large annual money return as that under notice.

The ancient civil divisions in Sussex are termed "rapes," in this county they are called "laths."

Excepting occasional north-eastern winds during spring, the climate of this county is congenial to both health and vegetation during summer and autumn, being more congenial to invalids than the south of Devonshire; but not so well adapted for weakly constitutions during the severity of winter and spring, the moister climate of Devonshire during the latter periods being warm, and consequently better adapted for the indisposed.

Isle of Thanet.—The subsoil of this district is a dry hard chalk, the more elevated portions of which are generally situated about sixty feet above the level of the sea; consisting of a surface soil, composed of a dry loose chalky mould, from six to eight inches deep; is mixed with flint, and, without manure, forms only a poor soil. The vales between the ridges and the flat lands on the hills possess a deep, dry, loamy soil, from one to three feet thick. The west end of the island, even on the hills, has a good mould for its surface, from one to two feet deep, rather inclining to be stiff. The deepest and best soil in Thanet lies on the south side of its southernmost ridge, running westward from Ramsgate to Monckton, where the soil is a deep, rich, sandy loam. Owing to the open character of the subsoil, the low lands are generally sufficiently dry to be ploughed flat, without the intervention of furrows. The soil on the marshes is a stiff clay, mixed with sea-sand and minute sea-shells.

Canary Seed.—Considerable breadths of the best land in the Isle of Thanet is sown with Canary seed, for the use of singing birds, usually taking in the rotation the place of wheat; viz. after clover leas, bean stubbles, and fallows. If the land be not naturally rich, a dressing of rotten dung is applied previous to sowing the crop. Whether manured or not, the usual course of tillage is to plough the land the first opportunity that offers after wheat-sowing is completed in autumn; and, as soon as the land is tolerably dry in the spring, the seed is sown broadcast, at the rate of about four or five gallons per acre, which is well harrowed in. When the blade appears and the rows are distinct, the intervals are hoed with a Dutch hoe; which is repeated in May and June with the common hoe, carefully cutting every weed, and thinning the plants in the furrows, if sown too thick. It is harvested later than any other crop; it is cut with a hook called a twibil and a hink, by which it is laid in lumps, or wads, of about half a sheaf each. The seed is strongly attached to the husk; and, in order to detach it, the crop has to be left for a long time on the ground before the seed becomes sufficiently loosened to thrash. The wads are occasionally turned, and have been known to remain in the field until December, without vegetating or suffering injury. The produce is from three to five quarters per acre. The straw forms admirable fodder, and is much relished by horses; in fact, there seems no good reason why this plant should not be grown extensively as a forage plant on strong lands, particularly as the seed is a much more valuable crop than wheat.

Radishes are also sown extensively for seed in this district, the produce being sold to the London seedsmen.

Much sea-weed is used as a manure in the Isle of Thanet, of which a strong north-east wind always drives large quantities on to the shore. After a heavy sea, numerous carts and waggons may be seen lining the coast, for the purpose of carrying it away. The sea-weed is sometimes applied to the land in the green state, but more generally mixed with the manure heap or composts.

East Kent.—The open part of the district between Canterbury, Dover, and Deal possesses a great variety of soils, consisting of boulder and London clay, chalk, gault, and greensand (Kentish rag); the more elevated chalk soils are generally occupied as sheep-walks; the arable soils are not under any precise rotation, the wet clays being, however, usually occupied with beans and wheat alternately: the beans are either drilled or dibbled, the sorts usually cultivated being mazagan and ticks. The celebrated white wheat of Kent is produced in this district, and is commonly sown broadcast: the reaping is accomplished by mowing or bagging. In mowing a cradle is fixed to the scythe, and the mower *strikes in* towards the standing corn, which is afterwards bound into sheaves, and the scattered straws raked up by a hand or horse-rake. "Bagging" is executed with a stout hook, without teeth, in the form of a sickle: the workman strikes the instrument towards the standing corn, as near the ground as possible.

Owing to the general dryness, not only of the climate but also of the land, in consequence of so large a part of it overlying a stratum of fissured chalk, turnips and green crops of the brassica tribe are not much cultivated on light lands; mangold wurzel has, however, been tried of late years, and found to succeed well, so that it now forms a fair substitute for those well-known and valuable light land green crops. This part of the county, lying close to the seaboard, is well adapted for obtaining manures from a distance; some descriptions, however, are rather peculiar, such as sprats, mussels, five-fingers (star-fish), &c., which are made into composts with earthy and waste vegetable substances. The cost of sprats for this purpose is usually about 10d. a bushel, 50 or 60 bushels of which, when used alone, are applied as a dressing for wheat: five-fingers, 4d. per bushel; 120 bushels to the acre. Mussels are usually bought by the waggon-load for about 20s., and 150 bushels applied to the acre. Chalk is much used as a dressing on heavy soils. The Kentish turnwrist plough is in common use on stiff lands. East Kent hops are too celebrated to need further comment.

The Isle of Sheppy comprises an area of more than 20,000 acres, and has been famed, from the most ancient times to the present day, for its sheep, the exquisite flavour of which rivals King Charles' Banstead mutton. The tenacious London clay is here extensively developed, in consequence of which turnip husbandry is not much pursued; owing to which, the sheep-breeder is compelled at weaning-time to send his sheep to other districts, often 30 or 40 miles away, to be returned in spring. The ordinary rotation is six courses:—1, summer fallow, with manure, chalk, or lime; 2, beans; 3, wheat; 4, beans and clover; 5, wheat; 6, oats: of late, however, tares, potatoes, mangold, rape, &c., have superseded the superior fallow. Average produce:—Wheat, 4 quarters; beans, 4 quarters; peas, 3½ quarters; canary, 3½ quarters; oats, 7 quarters; clover, 1½ load, per acre.

Mid Kent, in which is situated the county town of Maidstone, has not unfrequently been termed "the garden of England," owing to the variety and luxuriance of its agricultural productions. A large portion of this district is formed of the greensand series, and is much occupied with the growth of hops and fruit. Within a short distance of Maidstone occur the principal plantations of Kentish filberts, which so abundantly supply Covent Garden. The filberts are carefully cultivated and pruned back, not allowed to exceed 5 or 6 feet in height, and are kept of a basin-like shape. The crop is uncertain, sometimes realising a large sum per acre. The greater part of the hops grown in this district are "the Goldings:" on stiffer soils less precarious varieties are cultivated, such as the "Grape," "Jones," &c.

The mould and other diseases are the great drawbacks on hop cultivation of the finer kinds, from which the coarser sorts on the Weald are often exempt. Owing to the great demand for hop-poles, coppice timber is much grown, every nook and corner being occupied in this growth. On some of the thin soils on the chalk hills good poles are grown, and instances are known of plantations on which a fall of ten or twelve years growth has realised more than twice the value of the fee simple of the land. The favourite kinds are ash, chestnut, and red willow.

Hops, being great exhausters of the soil, are of expensive cultivation, manure having to be bought in great quantities—woollen rags, shoddy, &c., being amongst the unusual fertilisers used; in addition to which, cattle are fattened to a considerable extent on corn and oil cake, in order to enrich and increase the manure heap.

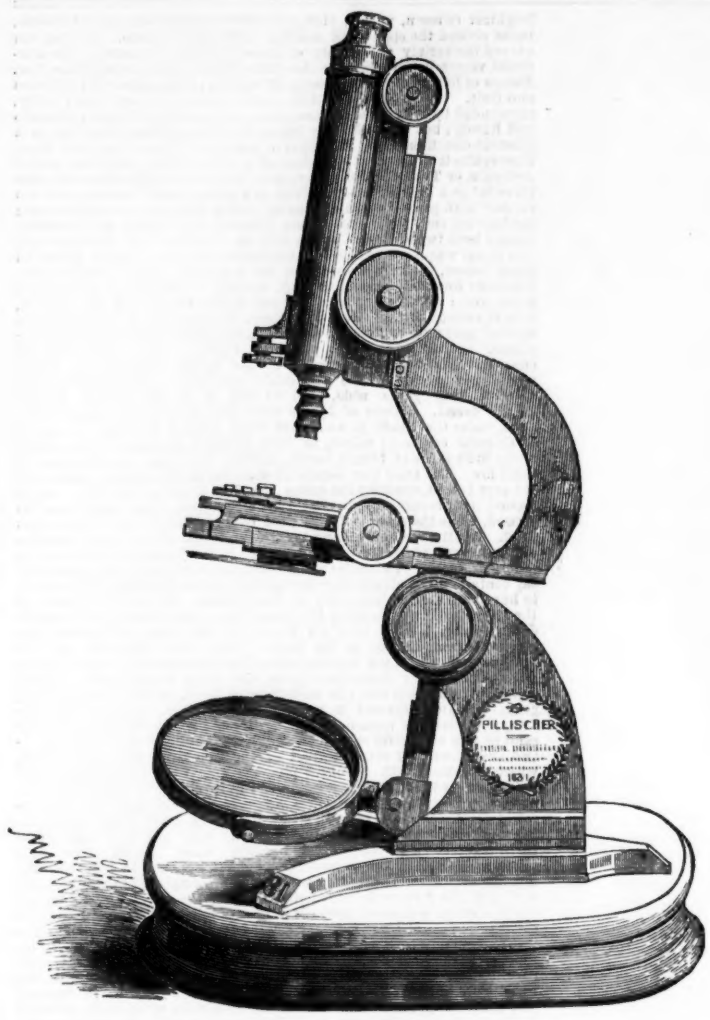
A few miles south of Maidstone is the great fruit-growing district, which supplies Covent-Garden market with the major part of British grown fruit. In this district it is a frequent practice to raise a hop, apple, and filbert plantation simultaneously on the same ground: for this purpose the soil is frequently trenched eighteen inches deep; sixty apple trees are usually planted in an acre, the intervening spaces being filled up with hops and filberts. The hops are said to be beneficial to the young fruit trees by the shelter they afford, and, with the thorough cultivation and manuring which the ground receives, tend to bring the trees to early maturity. The hops usually stand about fourteen years, when they are taken up to allow more room for the trees. The filberts generally require removing in about twenty-five years, at which time the apple-trees require the whole of the ground. Pears require the land to be tilled whilst young; but when arrived at maturity they bear and do well in pasture. Besides these fruits, gooseberries, raspberries, white and black currants, cherries, and plums are extensively cultivated. It is stated that mowing grass in cherry orchards is very injurious, causing the fruit to fall before it attains maturity, by suddenly exposing the surface of the ground to the action of a powerful sun.

The Weald is an extensive district occupying the southern portion of the county, the soil consisting of the Weald clay and the Hastings sands. The former is a strong yellow clay soil, of a cold retentive character; the latter consists of a series of alternations of sand, gravel, and clay, generally much covered with wood. Hops are extensively grown on the Weald, particularly in the iron-sand district. The Sussex breed of cattle are usually found in the Weald. The farms are generally small. On the eastern side of the Weald, bounded by the English Channel, is the rich grazing district of Romney Marsh, a level tract reclaimed from the sea, from which it is protected by an embankment, upwards of three miles long, between Romney and Hythe. The Kentish portion of this marsh occupies 44,000 acres, almost entirely grazed by one of the finest breeds of sheep in the kingdom, if hardiness of constitution is taken into account as being combined with heavy returns of carcase and fleece. Another breed of sheep—the improved Kent—is worthy of notice, the county being indebted for the first improvements to Mr. Richard Goord.

North-eastern District.—This may be called the market-garden district, the low lands being principally occupied with raising market produce, and comprises the parish of Greenwich, Woolwich, Deptford, Lewisham, Lee, Beckenham, Bromley, Chiselhurst, Eltham, Plumstead, to which may be added a belt of country, about four or five miles wide, between Gravesend and Dartford, the latter consisting of a light fertile soil, producing a large quantity of early peas, turnips, &c., for the London market. During the podding season, numbers of women and children are employed in pulling the peas, coming in swarms for the purpose from London, as also for hop-picking. The adhesiveness of the London clay soil in that part of Kent which adjoins the metropolis, is much ameliorated by the abundant application of long stable manure, and also by applying the spent bark from the extensive tan-yards of Bermondsey; these dressings, and the frequent application of soot, on clovers and young wheats, have, in some cases, altered the natural colour of the soil to a deep brown or black. Some of these market-gardens have more than 100 tons of stable manure annually applied. In this district, within ten or fifteen miles of the metropolis, it is usual on general farming land to sell the greater part of the straw and hay, purchasing manure in return. Some dairies are also kept for the purpose of supplying milk to the metropolis.

ISINGLASS AT THE EXHIBITION.—In Class 4 of the Great Exhibition, under the classification of "Vegetable and Animal Substances," Mr. James Vickers, proprietor of the house of Simpson and Humphrey, Little Britain, makes a very interesting display of isinglass, to show its character and different shades of colour, and also to illustrate the neat designs into which the article may be worked. Several of the specimens are formed into baskets, flowers, &c., and on the wall space a picture is exhibited, composed entirely of rolled and cut isinglass. The inscription draws attention to the various colours, and states the whole of the samples to be entirely free from artificial colouring or the ingenious adulteration so extensively practised and lately reported in the columns of the ILLUSTRATED LONDON NEWS of November 9th, 1850. The sophistication is further alluded to by the exhibitor in showing some specimens of packet isinglass, designed to restore confidence among consumers by affording an easy guarantee for the purity of so delicate and important an article

THIS SHEET WAS PRINTED IN THE GREAT EXHIBITION.



PILLISCHER'S MICROSCOPE.

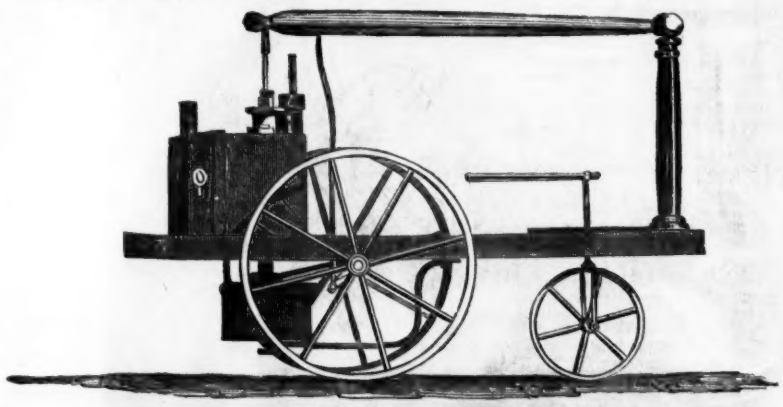
PILLISCHER'S MICROSCOPE.

Mr. Pillischer is one among the thousands of ingenious workmen who have lent their aid in accomplishing the great work of furnishing the Industrial Palace; and it would be well that all such men should be known to the mass of visitors who can admire the exquisite objects exposed in most departments, but who seldom stop to enquire who made them.

Mr. Pillischer, who is one of the best makers of microscopes in London, exhibits one of large dimensions, of exquisite workmanship, in order to show what can be done in his way. This beautiful instrument is the largest which appears in the Building, and is of the most approved construction, being in every respect properly placedas regards its centre of gravity. The stage is much simplified in comparison with those ordinarily used, and is worked by means of a rack and pinion, and Archimedan screw, the two pitches corresponding accurately with each other, giving $\frac{1}{4}$ths of an inch motion for each revolution. The fine adjustment works with a lever and screw, having 90 threads to the inch. The body slides on a groove, and can be adjusted by rack and pinion to the greatest nicety. As in the best microscopes, a draw-tube is fixed on the top of the body, to which the maker has added a very useful contrivance in the shape of a register, attached to one of the milled heads, whereby the nicest adjustment may be obtained, so that the examiner is enabled to look at the object under inspection while he is increasing the power to any required degree. He has also added an *erecting* eye-piece to the body, which is also another advantage.

Double Achromatic Opera-glass.—Though called an opera-glass, this instrument is sufficiently powerful (says Mr. Pillischer, the maker) to view objects at from five to seven miles distant. The body, of gold, is engraved in the Elizabethan style, and the whole is contrived so as to suit faces of various sizes. Frequenters of the opera are so much in the habit of purchasing French glasses, that they will scarcely believe that this elegant opera-glass is the work of a German, long resident in England.

Pillischer's Elliptograph.—Several instruments for the purpose of describing ellipses on paper have at different times been invented; that, however, which is illustrated by the two drawings, viz. a plan and elevation, appears to be not only simple in construction, but very suitable for its intended purpose. A is the standard, which is fixed, when required to be used, by two points through the paper into the drawing-board; B, the ratchet wheel fixed on the standard A; C, the handle which revolves in the standard A; D, the shifting bar which moves with the handle C, by which the diameters of the ellipses to be described are adjusted; E, the drawing pen or pencil; F, the rack, taking its motion from the ratchet-wheel B, and allowing the pen or pencil E to move with it; G is a bar attached to the pen or pencil-holder E, for setting the pen according to the figure required to be described. The three inventions described as above are placed with the Philosophical Instruments in the Middle Gallery (North), and towards the west end of the gallery.



WATT'S FIRST DESIGN FOR A LOCOMOTIVE.

JAMES WATT AND CO.'S LARGE MARINE ENGINES.

It is, indeed, gratifying to find the name of the great Watt so worthily represented by his successors, Messrs. James Watt and Co., who have contributed a pair of marine engines, of exquisite manufacture, to the mechanical section of the Great Exhibition. These engines are designed with a view to driving the screw propeller by direct action, without the intervention of gearing—certainly an immense advantage. Their collective power is equal to that of 700 horses. The general arrangement consists of four horizontal cylinders, each of 52 inches diameter, and having a stroke of 3 feet. The condensers are placed between the cylinders, with two double-acting inclined air-pumps. These engines are calculated for a propeller of 16 feet in diameter, making 65 revolutions per minute. Besides the simplicity and compactness which characterise these engines, they have the great and important advantage of occupying but little space; in addition to which, on account of their extreme height from the foundation being but small, they can be entirely protected from the effects of shot by being placed far below the level of the water-line.

THE LOCOMOTIVE ENGINE OF 1785.

Even more interesting to a majority of the visitors to the Great Exhibition than the beautiful marine engines of James Watt and Co., already described, are two models exhibited by the same firm, and side by side with the great engines: the former represents the locomotive engine of 1785; and the latter an oscillating engine, which was patented by the great Watt in 1784. Both models were made by Mr. William Murdock, the friend and assistant of the great improver of the steam-engine, in 1785. The locomotive engine on three wheels, with its cylinder and crank action, forms a wonderful contrast to the Crampton leviathan engines of 1851, and which are exhibited in the railway department, within a few yards of their extraordinary ancestor. A locomotive engine of the form exhibited by Messrs. Watt and Co. was made to run on the common roads in Cornwall in 1785 and 1786.

WATT'S OSCILLATING ENGINE.

The second model is of an oscillating engine, which is exceedingly interesting at the present time, owing to the great number of machines of the same class which have been sent to the Great Exhibition.

To the unlearned in these matters, it may be as well to say that an oscillating steam-engine is one in which the cylinder vibrates on an axis, either at top or bottom if placed in a vertical plane, or at one end if placed horizontally, so as to accommodate the rectilinear action of the piston rod to the circular motion of the crank. In this model the cylinder is cased with wood, whereas in our days the jacket is most usually made of felt.

REMOND'S MACHINE FOR MAKING ENVELOPES BY STEAM POWER.

The truly ingenious machine of M. Rémond, of Birmingham, exhibited by Messrs. Waterlow and Sons, and placed near to the north-east angle of the section devoted to machinery in motion, and very near to Applegath's vertical printing machinery, by which the ILLUSTRATED LONDON NEWS is printed in the Building, differs essentially from the envelope machine exhibited by Messrs. De la Rue in the middle aisle. In Rémond's simple contrivance atmospheric pressure is employed for the purpose of raising singly each sheet of paper, and placing it on the top of the folding apparatus; and, again, in giving the necessary inclination to the flaps of the envelopes previously to their being folded down by the action of the plunger. In order to understand the process, we may suppose that several hundred pieces of paper of the required size and shape are placed in readiness on the feeding table of the machine, which, by a very simple operation is started by the girl in attendance at pleasure. The top sheet is raised from the rest by means of a contrivance called a "finger," the underside of which is perforated, and a partial vacuum being formed, each sheet is sucked up against its under surface, and transferred to the folding apparatus, on reaching which, the exhaustion being no longer maintained, the sheet drops into its place. The folding apparatus consists of an open box or frame, the size of the required envelope, over which is fixed a creaser or plunger, fitting the inside of the frame. The blank piece of paper having been placed on the top of the box by the feeding finger previously described, the plunger descends just within the box, and the flaps of the envelope are thus bent to a right angle. The bottom of the creasing-frame or box is perforated to prevent any atmospheric resistance on the entrance of the paper, and the passing back of the plunger leaves the paper within the frame with its four flaps standing upright. At this point, the second application of the atmospheric action comes into play, for the purpose of giving the flaps of the envelope a preliminary inclination inwards, with a view to fit them for receiving the flat folding pressure of the return stroke of the plunger: to this end, the four sides of the folding-box are perforated, so as to allow streams of air to be forced against the outsides of the flaps of the envelopes, in order that, on the second descent of the plunger, they may all be folded down at once—the interior and under surface of the plunger being suitably formed to cause the flaps to succeed each other in their proper order. In addition to this, certain contrivances are adopted for embossing the outer flap of the envelope with any device required, and also for gumming the lowest flap, as a fastening for the completed envelope. In order to compensate for the continual decrease in the height of the pile of blank papers, and to provide for the upper one always coming in close contact with the lifting finger when the platform rises, the addition of a spring has been found to be amply effective.

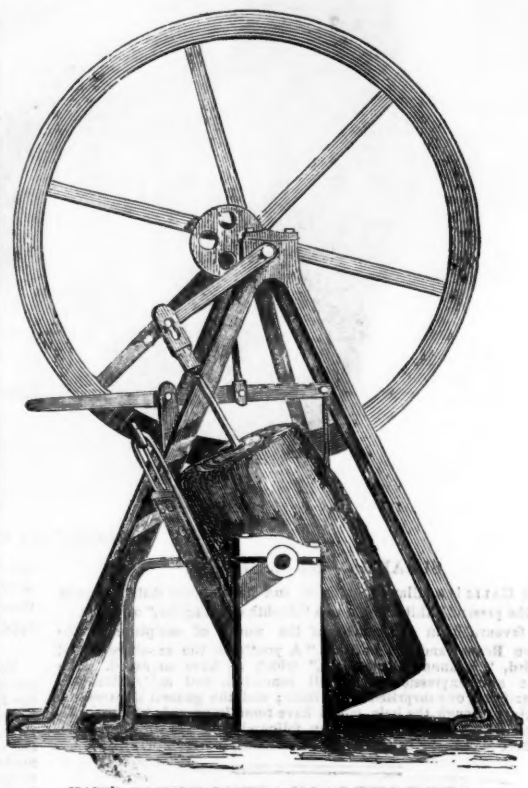
By this machine not fewer than 40 envelopes are produced in a minute, which gives as many as 24,000 per day, gummed, embossed, and entirely completed for use; if needed, the velocity might be increased. By the ordinary modes of production, the folding, gumming, and embossing, are all separate processes; and as at each of these operations every single envelope must be separately handled, our readers will have a tolerable notion of the economy gained by the use of Messrs. Waterlow's machine. The isolation of the different stages of manufacture consequent upon the employment of manual labour adds immensely to the cost of production, the loss mainly arising from the mere removals from one process to another. In embossing by hand, a boy will perhaps get through 8000 or 9000 per day, and then there must be an assistant to turn down the flap on which the device has been placed and arrange the envelopes in separate parcels.

It has been estimated that in the year 1843 about 330,000,000 of letters were posted in Great Britain only; and, calculating from ascertained data, we are probably not exceeding the estimate by computing the annual number at the present time at 500,000,000. But this is only one branch of the letter and parcel system; for, in addition to the distant transmission which must pass through the Post-office, the bulk of invitation cards, private notes, invoices, and accounts now involve the use of envelopes, and these do not of necessity pass through the Post-office.

Previous to the introduction of the penny postage system, envelopes were almost unheard of; for, owing to the peculiar system regulating the postage charges, all letters so enclosed were subject to a double rate as a double letter. The alteration in this respect, however, gave a powerful impulse to this mode of inclosure; and, in later years, its adoption has become almost universal.

FALLS OF NIAGARA.—MODEL EXHIBITED BY MR. CATLIN.

Among the various models which are to be found in several parts of the Great Exhibition, there is one in the American division of the eastern part of the Nave which may well attract the attention of the (at present) comparatively few visitors who are to be found in the large space allotted to the United States contributions. That one has been transferred by Mr. Catlin, from his collection of American-Indian productions, and placed on a large pedestal, in a conspicuous part of the Nave. The model, faithfully representing the "Horse-shoe" and American Falls (the former descending 150 feet, and the latter 163 feet), the various mills, hotels, residences, roads, and Goat Island, extending to 75 acres, embraces an extent of country equal to nearly a square mile; and being constructed to a scale of 90 *feet to an inch*, every object is very distinctly shewn. The amount of water descending over the two falls is said to be equal to 1,715,000 tons per minute, and which is chiefly derived from the drainage of Lake Superior, Lake of the Woods, Lake Michigan, Lake Huron, Lake St. Clair, and Lake Erie.



WATT'S FIRST DESIGN FOE AN OSCILLATING ENGINE.

PHILOSOPHICAL INSTRUMENTS.

The telegraphs first attract our attention, and include almost every instrument, from that of Alexander, of Edinburgh, who exhibited his multi-wire electric telegraph at the Adelaide Gallery in its palmy days, to Dering's novel telegraph, said to be adopted by the Electric Telegraph Company, who, at the eleventh hour, crowded many of their beautiful instruments and contrivances into a space far too small for the exhibition of such a series of telegraphic apparatus, but have now removed the whole series into a large and convenient office, on the west side of the principal entrance to the "Crystal Palace," where visitors may see the different telegraphs *practically* at work, as the wires are in connexion with all the main lines of telegraph in Great Britain. There are also several telegraph stations in different parts of the "Industrial Palace," at which small boys may be seen working Cooke's Needle Telegraph, and who are authorised to send messages—not too long—to various parts of London, for the small charge of 1s.

Next in order we may mention the Messrs. Highton's instruments, which are exhibited by the British Electric Telegraph Company—a formidable rival to the old company. All Mr. Highton's improvements in telegraphic apparatus are here fully represented.

It is quite impossible, in this introduction, to do more than allude to the various beautiful telegraphs which render this compartment of the Exhibition one of the most interesting and important of any in the Building. We find, however, the instruments of C. V. Walker, the superintendent of the South-Eastern Telegraph; Henley's splendid instruments, and his immense permanent magnet; Bakewell's important writing telegraph; the American printing telegraph, exhibited by the Messrs. Brett, and Mr. A. Brett's instrument in a glass case; and, lastly, Whishaw's one-wire index telegraph, a model of his hydraulic telegraph, which was exhibited at the same time as Alexander's multiwire electric telegraph, at the Adelaide Gallery. Mechanical and acoustic telegraphs of the same gentleman also form conspicuous objects in this division; and, above all, his telephones and telekouphona, the use of which have now been tested by the British public for the past three years.

Close to the telegraphs we find Messrs. Knight and Sons, and Messrs. Horne, Thornthwaite, and Wood, as the principal exhibitors—the former showing a beautiful air-pump and complete portable laboratory, and the latter displaying a galvanic battery on Smee's principle, an electro-galvanic machine for administering medical galvanism, two splendid electrotyped busts, and Rutter's electro-magnetic fire and thief detector, not to omit the most complete dissolving view apparatus which we have yet met with. We are glad to find our old friend Varley, together with his clever son, exhibiting their various improvements in microscopes, double-action air-pump, and reversing camera.

In the Western Gallery, Mr. Brooke's self-registering magnetic and meteorological instruments deserve to be mentioned, as among the most really useful and interesting objects in this part of the Building. In the same gallery, but to the north of Willis's great organ, are Newton's large celestial globe and Miss Readhouse's model of the moon, the latter having been executed by this talented and persevering lady at a cost of much time and patience, having occupied three years in completing.

To the east of the Philosophical Instruments an elevated platform or false floor is erected, for the exhibition of the pianos and other musical instruments of the principal makers in the kingdom, including the pianos of Collard, Erard, Wornum, and Mott, Robson's enharmonic, with corrections for alterations in temperature; Holdich's organ of three stops, equivalent to one of six stops of the ordinary construction; Dawson's autophon, which enables the unlearned in musical manipulation to play the most difficult tunes of the best composers; a fine array of Kohl's wind instruments; and last, though not least, but which is located by itself in the western gallery, the great and surprising organ of Willis, which has occupied months in its erection. The weight of this instrument is calculated at thirty tons, and the number of pipes is somewhere about 5000. Besides this gigantic instrument, Gray and Davison exhibit in the east gallery a fine organ, which added so much to the musical effects, under the direction of Sir George Smart, on the day of inauguration.

"SUSANNA."—BY A. GALLI.

SUSANNA.—BY A. GALLI.

SIGNOR GALLI is a Milanese sculptor, and he has three statues in marble in the present Exhibition: one a "Jephtha's Daughter," of which spoke favourably in our notice of the works of sculpture in the Austrian Room; another, entitled "A youth on the sea-shore;" and the third, "Susanna at the Bath," which we have engraved. The attitude and expression are well conceived, and aptly illustrate the situation of one surprised at a bath; and the general treatment is satisfactory, though the hair might have been improved, had the softness and flexibility of nature been followed, and the drapery, what little there is of it, by being lighter in material, and freer in disposition.

SKETCHES IN CEYLON.

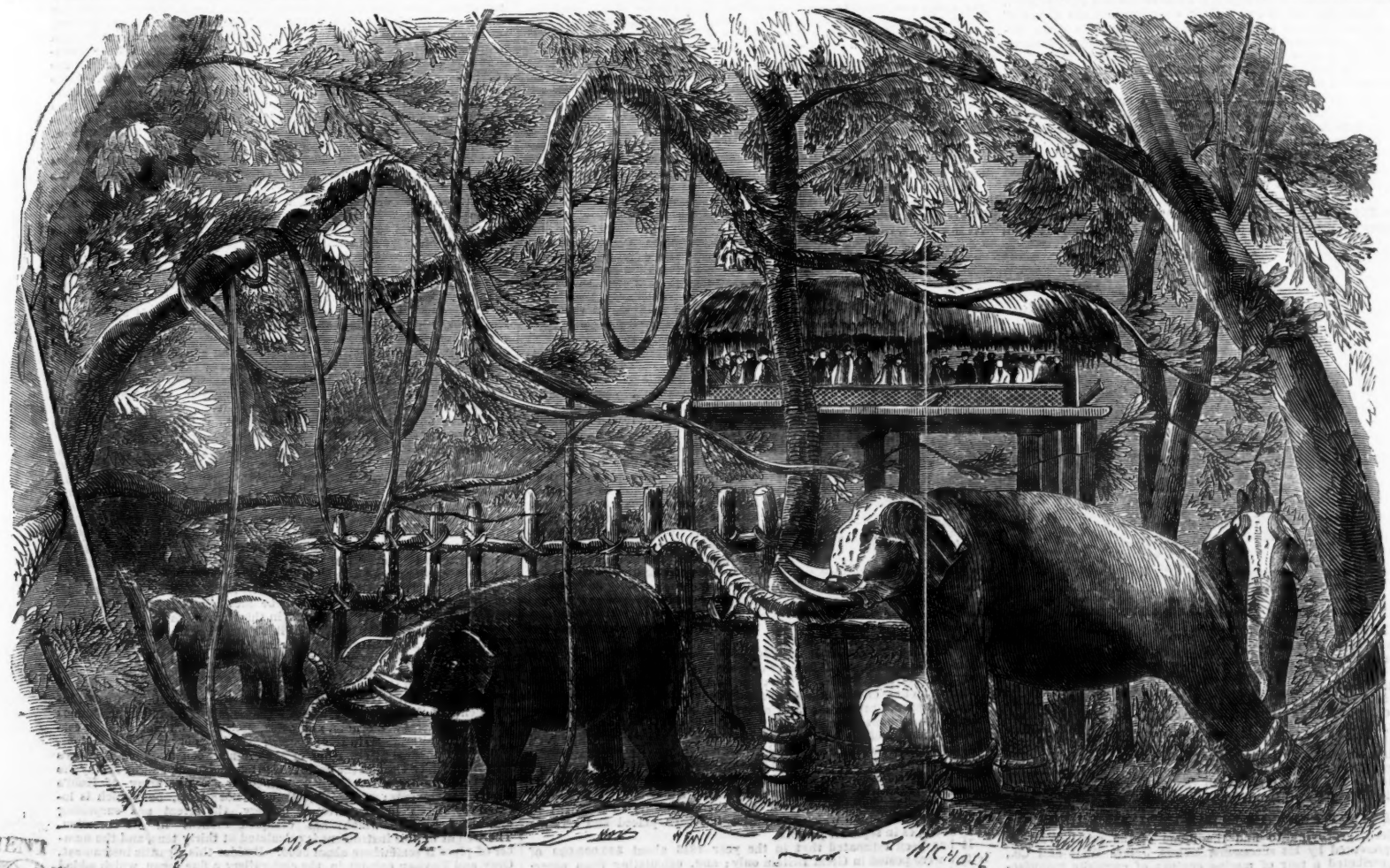
ELEPHANT KRAAL.

ONE of the most remarkable and exciting scenes in the island of Ceylon to the European, is the capturing of wild elephants. The following is written by Mr. Nicholl, the artist, who made a number of sketches on the spot, at the Kraal, which took place in August, 1847, two of which appear in our present Number:—

(*To the Editor of the* ILLUSTRATED LONDON NEWS.)

Sir,—I left Colombo on the 28th July, 1847, by the Kandy mail, to proceed as far as Ambepusse. After crossing the bridge of boats, over the Kalang Ganga, the scenery assumed a beautiful sylvan character: the road runs for a considerable distance along the opposite bank of the river, through a thick grove of suria and cocoa-nut trees, native gardens on either side, containing mango, pomegranate, plantain, custard, apple, clove, bread fruit, citron, and lime-trees, which throw a delightful shade across the road, at all times of the day, so dense is the leafing; while in the more open parts of the country, the areka-nut tree raises its graceful stems, with clusters of nuts, its deep green leaf, which resembles that of the talipot, spreading against the sunny sky. The pepper, with its red and green berries, and other creepers, with the brightest crimson, purple, blue, and yellow convolvulus-formed flowers, twine around the stems and amongst the dense foliage. Nothing can exceed the variety and beauty of these wildings of nature, or the wonderful vegetation presented to the eye in Ceylon at this season of the year. Masses of foliage cover the face of the country, bespangled with blossoms and fruit. The rest-house of Ambepusse is situated in a secluded valley, surrounded by lofty wooded mountains, and is midway between Colombo and Kandy; but the route now taken was Kornegalle, which lies in a different direction, along the banks of the Maya Oya, a clear rapid river. Kornegalle is situated at the foot of a high rocky mountain, called Aetegala, or Tusk Elephant Mountain. The last 22 miles of the road was travelled in a bullock bandy, which is a narrow cart, the sides and top covered with plaited cocoa-nut leaves, called cajan, as a protection from the burning sun. This part of the journey was tedious and tiresome, having been twelve hours and a half in searching the resting-house. The Kraal was close to the Kimboolwona Oya, or Alligator River, 18 miles distant, where we proceeded on horseback along a bridle path. Elephant Rock was seen on the left, clothed nearly to the summit with forest trees; on the right were now and again seen, in the far distance, hills of various forms. Here we entered a dense forest; immense bare roots of aged trees had crept over the narrow path, covered with creeping plants, having great sharp, poisonous thorns. In a few miles we emerged into the open country; then again entered the forest, where not a ray of the sun could penetrate. The Kimboolwona Oya is forty yards wide, and its bed is at this season as dry as the desert. Groups of figures were seen bivouacking in all directions, under the shade of enormous trees, dressed in many a variety of Oriental costume; others, in more exposed situations, were sitting under little sheds of talipot leaves, cooking their rice in chotties on a wood fire. The trees were festooned with the finest creeping plants the eye ever beheld, covering the entire tree like a net; jungle-rope coiled around their branches, extending from tree to tree, some resting on the ground, while the other end stretched over a branch some 70 feet overhead. In all directions around lay the skulls and other skeleton remains of the forest lord, scattered and bleached in the jungle, to tell the result of former kraals. Two miles up the river, passing a deep pool, which they say contains many alligators, you come to the ruins of a bridge, which is said to have been erected before the birth of Christ. All along the banks of the river, huge overhanging iron-wood trees were burning and smouldering away, having been set fire to in the drive, to prevent the elephants from straying up the river. Three miles down the river is another pool, where the hunters bathe the elephants, a group of which were seen cooling themselves under the shady trees, masses of grey rock rising on either side; in mid-distance tents, talipot bazaars, and groups of figures dressed in many a variety of colour; while far, far away, hundreds of human beings appeared like specks on the sunny sand of this wonderful spot, then inhabited by thousands—in a day or two the silent and secure retreat of the animals of these forest wilds, where song-birds with beautiful plumage sing their sweet notes, amid the unequalled blooming vegetation of this lovely land. The Kraal was an enclosed space of about three acres, in the Nellegelle Mookeleene forest, and is made of the stems of strong trees fixed firmly in the ground, with transverse beams, and powerful supporters tied together with stripes of bamboo cane placed two feet apart, so as to allow the mahoots, or elephant hunters, to pass out and into the enclosure. Several thousand men are employed in the drive for weeks, in the forest; fires are lighted during the night, some distance apart, forming a circle of upwards of twenty miles. The fires are placed on stands of slight construction, a small quantity of earth placed on the top, and covered over with talipot leaves, to protect them from rain; these stands are moved nearer each other, each day, as the circle narrows. Elephants have a great dread of fire: the drivers shout, beat the tom-tom (a kind of drum), and fire guns; they are thus driven forward to a confined space, little more than one mile wide, which is the entrance to the enclosure, narrowing until it terminates with the gate leading into the Kraal. Four or six tame elephants are allowed to stray about the entrance; two of the first class were called Cereberry and Wira. On the approach of the wild animals, they seem to caress them and join the herd, actually leading them into the snare. Thus, the tame elephant becomes the seducer of her brethren of the forest, and seems to delight in their capture as much as man.

We waited patiently for the entrance of the elephants into the Kraal, from one in the afternoon till half-past nine at night. It was thought that some rascality was at work to cause disappointment; when all at once the guns went bang, bang, and the voices of the drivers became louder. As the elephants approached, a shout was given by the people on the stand, but too soon, as it frightened them back, and it was thought they had escaped. The repeated firing of guns was heard once more: the noise increased, drivers shouting, tom-toms beating; then a sudden rush; when, in an instant, as if by magic, around the enclosure was one brilliant glare of light. Blue-lights, torches, and fires shed a dazzling blaze on the scene, as the maddened herd crushed and dashed through the Kraal, spreading destruction around. Huge trees were crushed to splinters and dashed to the earth; and the spot which had been a portion of dense forest and jungle,



ELEPHANT KRAAL, ISLAND OF CEYLON.

SUPPLEMENT
ILLUSTRATED LONDON NEWS

appeared in a few minutes like a ploughed field, whilst their trumpeting rent the air, as they raced and tore about, round and round the inclosure, which was surrounded with blazing piles of wood, and thousands of people from all parts of the island. Eighteen elephants were captured, some of them the largest I have seen, and three very small ones.

Next morning, the tying commenced. Six tame elephants entered the inclosure, the mahoots, armed with spears, mounted on their backs: the wild ones kept in a herd, the punchies, or little ones, running under the bellies of their mothers. Often would these affectionate and noble animals, when maddened by the hunters, cover their little ones with their trunks to protect them, as they raced up and down. Now and then a charge was made: one of the herd would elevate his trunk, his tail stretched out, huge ears cocked, and race through the inclosure, bellowing most frightfully. Two of the tame ones would single him out, one at each side, while, should he prove unruly, a large tusker would follow, goading him behind: then, crushed between the two, the mahoot slipped a noose on one of his hind legs; he was thus dragged to a tree, and there tied; his three other legs were afterwards secured in like manner. So the herd were taken, one by one, until all were secured, except the three little punchies, which were allowed to go at large. It was truly a melancholy sight to see these noble animals, who had roamed these wilds, the undisputed monarchs of the forests of Ceylon, overcome, exhausted, bound captive, crying most piteously; some of them lying stretched on their side, and the little one sucking their captive mother.

At the close of the tying, the procession to the watering-place (Alligator Pool) took place; the ladies carried in palankeens, and the gentlemen walking in procession; Cereberry and Wira leading two of their captive brethren, with the hunters mounted on their backs, to water, followed by all the chiefs and herdsmen, down the Kimboolwona Oya; crowds of spectators standing under the shady trees to witness the scene.

In these regions (we have no twilight) darkness—when there is no moonlight—intense darkness, quickly comes on. It would be impossible for any description to convey an idea of the beautiful effect of the firefly, which is the loveliest of all insects: countless myriads of them bespangled the jungle, every tree was literally covered with them; they shone as brightly as the stars in the heavens on a clear frosty night.

I made twelve sketches of the Kraal, and rode to Kornegalle on an elephant's back, the Modliar having disappointed me in sending a horse.

This Kraal was got up in honour of Lord Torrington's arrival in Ceylon.

ANDREW NICHOLL, A.R.H.A.

THE GREAT TEMPLE OF DAMBOOL, CEYLON.

The Great Temple of Dambool, founded by King Walagam Bahoo, a century before the Christian era (like all the other rock temples in the Kandyan county), is constructed partly in a cave or hollow of a huge overhanging rock, 500 feet in height. The entrance is a noble specimen of Eastern sculpture, carved out of the face of the rock. The ceiling is gaudily ornamented with painted cloth, which has a grand and imposing effect. It contains 46 statues of Buddhu, two kings, and three gods, and measures 156 feet in length, 73 feet wide, and 24 in height. At the front, near the entrance stands a very handsome dagobah, with four sitting figures of Buddhu. The first chamber or temple of the great god is called Mahu Dayio Dewale, from the statue of Vishnu, before which trials were decided and oaths taken. This statue is one of the transformations of that god, termed Ramachandra. There is also a reclining figure of Buddhu cut out of the rock, measuring in length 50 feet. Dambool Temple is the most celebrated and magnificent in Ceylon. Its entrance, in the side of the rock, is fully 100 feet above the surrounding country, and commands a very extensive view of the vast forests, which extend as far as the eye can reach.

The accompanying Illustration was sketched from nature by Mr. Nicholl, who also has given us this account of the place.

BACCHUS RECLINING.—NEURINI.

THIS very spirited statue stands in one of the front bays of the Tuscan department. It is in white marble, by Professor Neurini of Florence, and as the date upon it "1850" implies, was probably executed expressly for the Great Exhibition. The god of wine, who has none of the bloated appearance attributed to him by modern conventionalism, is reclining in an easy graceful attitude, whilst he squeezes the juice from a bunch of newly plucked grapes into his mouth. The treatment and execution are of a high order of merit.

FISHING TACKLE.

IN our article under this head we omitted to notice Mr. Banim's (Fishing Tackle maker, of Kilkenny) contribution, No. 160, Amateur Fly-anglers' Cabinet, made of Irish bog yew, which, from arrangements then going on at that part of the Exhibition, had been placed out of our sight. It is a contribution so thoroughly in accordance with several of the observations we there made, as to induce us at once to return to the subject, and do justice to one who is evidently a practical master of the craft. It is intended for the use of such anglers as prefer to follow their sport with flies of their own fabrication, and contains ten drawers and two open compartments. In the drawers are all the requisites for the amateur fly-maker, arranged in an orderly and neat manner, while the open compartments are for the reception of furs and feathers preparatory to arrangement in the drawers.

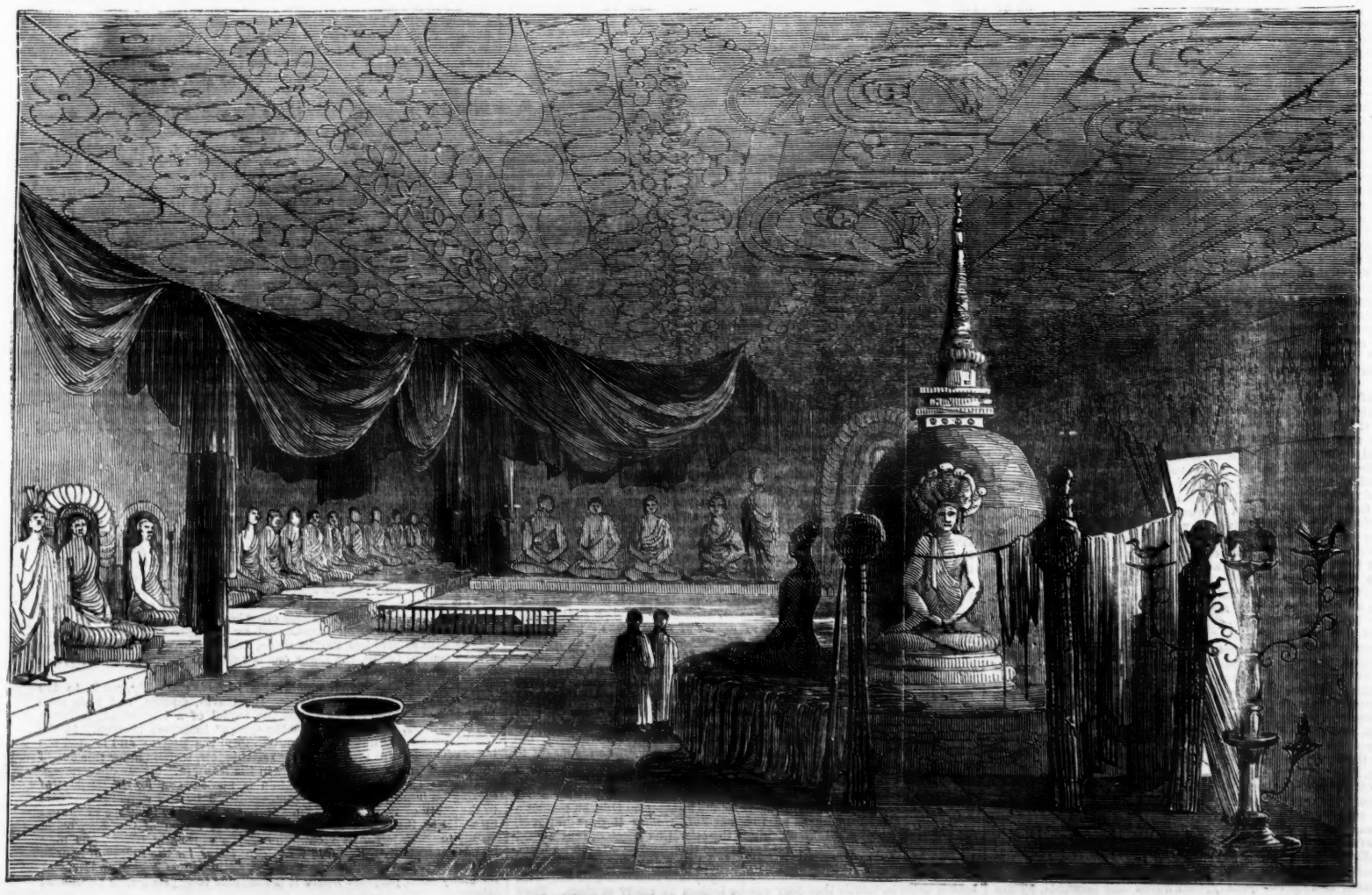
"BACCHUS RECLINING."—BY PROESSOR NEURINI.

In the drawer the lowest of the first series is a book of quarto size, intitled "Book of Trout Colours." This book contains the prepared dubbing for forming the bodies—or, scientifically, the thorax and abdomen—of trout flies. The colours and dubbing so prepared are placed in the leaves of the book, according to the season—the earliest being marked No. 1, and the number continuing to the end of the summer. Samples of the flies made therewith are found here.

Introductory to this "Book of Trout Colours" is an essay on the characteristics and *hues* of aquatic insects, in which the theory of the angler's peculiar mode of studying the river ephemera for his especial purpose is laid down. The theory propounded on this interesting subject is novel, and is founded upon good data. Nor are the inductions the mere result of theory alone; for, if we are rightly informed, some forty years' experience has entitled Mr. Banim to propound his views with a more decided tone than his modesty has permitted him to use. At all events, it invites the examination of the practical angler, the more particularly as the actual manufacture of the flies in their various stages admits of the severest test. In another drawer of the cabinet is a second book—"The Book of Salmon, Lake, White Trout, and Pike Colours," with the materials of the flies, and a short essay with the rules for their fabrication.

The Cabinet appears to be, as to its contents, a theory on aquatic insects, with a practical and mechanical application—a conjunction of anglers' science, with the angler's *bonâ fide* experiments founded thereon. It will therefore be seen, that, while it possesses a large amount of interest to the fly-fisher, it affords no little instruction to the naturalist.

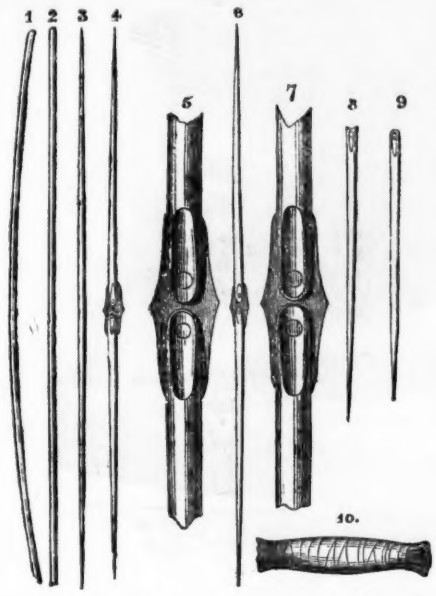
There is an angler's winch in Section 23, Mr. Higgin's case, which, from its not being mentioned in the Catalogue, escaped our observation. It certainly possesses features of novelty, inasmuch as it will permit of the angler casting his bait direct from the winch, without any check from the cogs of the wheel. This, indeed, would be a great advantage, were it not attended with very awkward drawbacks. It is true, that, if the winch be left wholly unchecked, the line may be thrown to a considerable distance without the necessity of first laying the line in coils at the feet of the angler, as is now the case, and which necessity too often involves the line in considerable entanglements from stubble or briars; but, on the other hand, a strong cast from the winch itself is as certain in one trial out of three to meet with a recoil at the termination of the throw, which winds the line partly back again upon the winch and creates snarles of the most vexatious kind. Our readers are mayhap acquainted with the toy known as the bandeleur, which is suspended by a string wound around it, and being dropped from the hand (the end of the string being retained), descends some distance down, and, by its own rotary motion thus acquired, winds itself up again in a contrary direction. Much after this fashion is the principle of this winch; and the consequences are, to a certain extent, alike. We know this to be the effect even with the common winch, notwithstanding the friction of the cog-wheel. But what does a good angler want with anything of the kind? the supply by the hand is always sufficient when the fish has taken a trolling bait. It appears to us, that the object sought to be achieved by many of these so-called inventions is, to reduce angling, as far as possible, from an art or science to a mere bank-runner existence; not that we at all object to any really useful appliance that shall abridge the labour incident to the pursuit of the gentle craft.



THE GREAT TEMPLE OF DAMBOOL, CEYLON.

NEEDLES.

THE art of needle-making, in many of its departments, presents much that is generally, or, to use a term common-place enough, popularly interesting to a large class of readers; yet, remarkably little is known as to the manner in which the tiny article in question is produced; and of the immense number of the "needle-using population," but a small proportion have a due conception of the operations and processes through which a needle goes, from its rough form to the beautifully polished instrument used oft "by ladye fair, and maide of low degree." Our Illustrations represent a needle in its various stages of progression:



In noticing these, we shall attempt to describe the nature of the operations, in detail, as fully as the very limited space at our disposal will admit of. Brief as this must necessarily be, we trust that it may be worthy of a small corner—in keeping with the tiny article of which it treats—in the boudoir of the lady, or the little wall-nook or humble book-shelf of the peasant girl's home.

Plied in the busy hands of thousands, the little needle in our social and domestic circle plays an important part. Now, vyeing in lustre with the sparkling gems on the fair hands of the high born damsel, the little glistening instrument assists in weaving on the canvass the bright colours which serve to deck the stately mansion; now assisting in the more useful, if not so elegant a purpose of ministering to wants, not luxuries; anon in cozy rooms, the curtains drawn, the bright fire blazing cheerily,

> The needle plies its busy task,
> ———The threaded steel
> Flies swiftly.

And thus, in hall and bower, and every room of the "snug citizen," the needle plays its part. But not alone in these, alas! does the instrument perform its work; could dead walls speak, and cheerless rooms tell tales, how piteous would the recital be! "In garrets cold and mean," how weary are the lives of those who ply "their needle and thread." Truly, if there is not a wrong but what is sure to bring down its punishment, the misery, the sickening influence of hope deferred—endured the dragging out of a mere existence, a living death, on the part of those poor creatures—is recorded in Heaven's chancery, in all its piteous hideousness, as evidence against us as a nation. Glad are we that the day has come when noble attempts to rescue our seampstresses from their fearful position are becoming matters of daily recurrence; and assuredly we deem it no small privilege here to advocate, though in truth but slightly, their claims to the consideration of our readers. May those of our fair readers who have the will and power, use their best endeavours to ease aching hearts—to make the needle, the companion of their happy homes, in wasted and wearied hands to ply its task more cheerily.

Lost, broken, disabled, lent, borrowed, tossed here and there and everywhere—where do all the needles go to? The question has been often asked in connexion with the fate of the missing ones of its kindred or sister article, pin, but with no decisive answer as yet, so far as we know, being obtained. And such is likely to be the fate of our question. Although there may be more interesting matter in the philosophy of the question than we wot of, we leave its consideration for that of one of more immediate interest—"Where do all the needles come from, and how are they made!"

It would have been interesting at this point to have traced the history of the art of needle-making. This, unfortunately, we cannot do to any great extent. The materials to assist us in such an inquiry are amazingly scanty; and, although we have "searched and better searched," to use the quaint language of the nursery story, all sorts of books, from the thin and lanky pamphlet to the ponderous encyclopædia, all the information we have been able to hunt up on the subject is the meagre yet sufficiently interesting fact, to not hypercritical minds, that "Needles were first introduced into England in 1540, in the reign of Elizabeth, by a native of India;" so that it appears, that, amongst other things, we are indebted for the needle to the "glorious reign of good Queen Bess." The above important fact seems to be a stereotyped one, as every writer ventures it; but the flow of the historical lore is soon stopped for want of material, and to "close the period up," a little bit of traditionary matter is added, to impart to the whole recital something like the dignity of historical research. The tradition is this—that the above-mentioned native of India having died, the manufacture also died with him, but that, tradition sayeth not how, it was revived by one Stephen Green, in 1560, who was settled with his three children—mark the historical circumstantiality of the details—Elizabeth, John, and Thomas, by Mr. Daman, ancestor of the Lord Milton, at Long Crenden, in Bucks, where the manufacture has been carried on from that time to this present day. As to the truth of this tradition we cannot positively say; but it certainly is the fact, that for many years the manufacture has been carried on solely at Redditch, in Worcestershire; and to no extent worth noticing in any other place, city, or town in the kingdom, with the exception of a factory in Bucks, where needles are made called "sail," not the beautifully polished, the gently-tapered and smooth-eyed article that ladies use.

Needles, as all our readers are aware, are made of steel, the steel being made into thin wire, of a diameter proportionate to the fineness of the needles to be made. As the wire is brought to the factory in circular bundles, the first operation is untying them and cutting the wire into certain determinate lengths. A pair of shears, of rather large dimensions, are fixed to the wall of the cutting shop, having the blades uppermost; one limb is fastened, the other is loose. The workman is provided with a guage by which the length of the wire to be cut off is determined. Uncoiling the bundle of wire, he puts the end into the guage, and placing the series of wires forming the thickness of the coil between the blades of the shears, he presses against the loose limb with his thigh, and, by moving the coil up and down to assist the cutting action, he speedily severs the lengths from the coil. Proceeding thus, he cuts off a series of lengths till the coil is exhausted: out of one coil he may thus obtain as many as 40,000 distinct wires. The coil being circular, it is evident that each individual wire must partake somewhat of its curvilinear shape; in fact each is far from being straight. Fig. 1 is a *fac-simile* of the wire at this stage. As one of the requisites of a needle is that it shall be straight, the next process is to straghten all the wires. Supposing two of the curved wires in Fig. 1 to be placed in the palm of one hand, and rubbed quickly, backwards and forwards, by the fingers of the other, a slight straightening would ensue; but, if the needles were removed to a hard flat surface, as a table, the operation would be much facilitated. If, however, a dozen or two of wires were to be placed on the table, and so kept as to lie close to one another, and then rubbed, the pieces, rolling one upon another, would soon be straightened, as the round part of one would roll upon the flat part of another, and thus, by the continuance of the process, the whole wires would be straightened. This is, in fact, the *rationale* of the process carried on at this stage of the manufacture. Two rings of iron are provided, some 3 inches in diameter, ½ inch broad, and thes ame thick; these are placed a distance apart on a flat stone slab some 18 or 20 inches from the ground. The distance between the rings is such, that, when the wires are placed within them, the ends are flush or even with the outer surfaces. Supposing a number of wires are placed thus, sufficient to fill the interior of the rings one-half of their diameter or so; the whole are fastened tightly in, and placed in a furnace and heated to a red heat. They are then taken out, placed on the slab, and the fastening removed, so that all the wires are free to move one upon another. The workman then takes a piece of curved iron, some inch-and-a-half broad and half-inch thick: he places the curved or convex side of this on the top row of wires between the rings, and, pressing forcibly by means of his hands at either end of the iron, works the rings briskly backwards and forwards on the slab. By this means the wires are kept rolling upon each other, and continually shifting their places, thus presenting a new portion of their surfaces to the action of their neighbours. The shifting of the wires may easily be ascertained by inserting a piece of cold wire, which, being black, is easily observable among its red neighbours. Near the bottom of the ring, in a few seconds it will be seen at the top, its course being distinctly traced, winding its eccentric way amongst the others. When cold, the wires are all straight, as shewn in Fig. 2. The next operation is the pointing. In order to save time, each wire is long enough to form two needles; each is therefore pointed at both ends, as seen in Fig. 3. The grindstones by which the wires are pointed are of small diameter, not more than 10 or 12 inches, but they revolve at an immense velocity, the moving power being generally water-wheels. Each grinder sits on a low stool, in front of the grindstone, a small trough of water being placed before him. Taking up 60 or 100 needles, according to their quality, he places them on the palm of the right hand, so that the ends project over the length of the fore-finger. Next placing the left-hand fingers on those, the thumb grasping the back of the right, he is enabled so to move the whole range of wires that they may rotate with ease on their axes, and yet without rolling over one another. He then applies the points of the wires to the rapidly revolving grindstone: if he held them always in one direction, the action of the stone would be such, that the points would be bevilled off like chisels; but by the fingers he makes them all to revolve, thus giving to each a gently tapering and perfectly round point. As the wires are apt to project unequally over the finger, thus presenting one wire longer than another to the grindstone, the workman every now and then strikes the points gently against an upright flat-faced piece of timber, somewhat in the same manner as a person shuffling a pack of cards makes them all even by knocking their ends upon the table. On the wires becoming red-hot, the workman dips them into the trough of water placed before him. A brilliant stream of fiery sparks is continually passing from the points. The matter thus evolved being inhaled into the lungs of the workmen, formerly rendered them a peculiarly short-lived race. The deleterious products are now, however, by the use of a powerful fan, drawn away from the zone of respiration as soon as they are produced. The trade is now as healthy as any other. The operation of grinding is exceedingly interesting, and presents an exemplification of the dexterity attainable by long practice in any one branch; but this remark is equally applicable to many other departments in the manufacture of needles. A good workman can point upwards of 10,000 in an hour. It is amusing to see the rapidity with which he will take up a handful of wires, point an end of them all, and turning them so as to present the other ends to the stone, lay them aside perfectly pointed at both ends.

The wires thus pointed are next taken to the "stamping shop," and here the wire first gains its approach to a needle. Such needle is to be rounded at the head, and have a hole made there, called the eye, as also an indented channel on each side, called the "gutter" of the head; the stamping makes the round form, and marks the place of the eye-hole. A wooden-framed stand, or table, is provided, with a massive anvil, on the upper surface of which is placed a die or design in intaglio, similar to that shown in fig. 5; a weight is suspended by a rope over a pulley placed above the table, and plays between two vertical guides; the same design as in the die is made on the lower surface of the weight, but in relief, or protruding from the surface. The lower end of the rope sustaining this weight is provided with a stirrup, in which the workman can place his foot. Standing before the table, he takes a number of needles in his left hand, and with his right places each wire exactly in its centre on the lower anvil or die, and letting the weight drop suddenly, by raising his foot, the design is impressed on the centre of the wire, on both sides, as seen in fig. 4. Fig 5 is an enlarged view of the centre part of the wire. The round circles are the places through which the eye-holes are to be punched; they are very slightly indented at this stage, merely enough to denote their situation. By depressing his foot, the workman lifts the weight, and places another wire on the die, allowing the weight to drop suddenly, as before: the impression is made, and the wire cast aside, to be replaced by another, and so on. So rapidly is the process gone through, that it is actually inducive of an optical deception. The workman takes each wire from his left hand, places it upon the die, withdraws it, and throws it aside to take up another, so very quickly, that a quick-eyed witness of the operation actually believes that it is but one and the same needle that the operator is moving out and in. Considerable nicety is required in the stamping, as each wire is to be placed so that it will be struck exactly on the centre; the chief guide to aid him is the eye; and so rapidly does he become aware of its being wrong placed, that he arrests the fall of the weight at any particular point of its descent: indeed, the facility with which he can do this by the immediate action of the foot is not the least remarkable matter observable in this department.

The eye-holes are next to be punched. This operation is generally performed by little boys. A small screw punch is used for this purpose. The lower end of the punch is provided with two projecing points placed at a distance from each other, exactly equal to that between the indentation formed in the wire, through which the eyeholes are to be made. The little operator, taking a number of the stamped wires, spreads them out like a fan, and placing each one on the centre of a small slab, brings down the upper slab, which makes the holes in the wire forming the eyes. This is a very nice operation, as the slightest misplacement of the wires, so that the centres were not in the right places, would involve the spoiling of each, from the punches passing through wrong places. To guide the operative, a small indentation is placed in the lower slab, or bed; into this the wire is placed: by means of this, a delicacy of touch, and a quickness of the eyesight, almost every wire is placed on the slab, and properly punched in the exact places.

Each of the wires has two moulded parts, gutters, and eye-holes in the centre; the next operation is the dividing of these so as to form two needles. Figures 6 and 7 show the needle in this stage previous to the dividing. Figure 7 is an enlarged view of the centre of fig. 6. The first step in dividing the wires is what is termed "spitting," that is, passing a fine steel wire through the eyes of perhaps a hundred wires, as there are two eyes there are also two wires; when they are all thus spitted, by bending them backwards and forwards between the hands, they are broken in the centre, one-half remaining on each wire. Before dividing them, however, the protuberances on either side, as seen in figures 4, 5, 6 and 7, are filed off, by placing the wires (spitted) on a convex block, keeping them tight thereon by means of a leather band, while the workman uses a smooth file. When broken, each needle has a square head as in fig. 8. It is nicely moulded by means of a very small grindstone, as seen in fig. 9.

We have thus far traced our piece of wire to a very respectable-looking needle; but, much as it would be prized by a savage, it is by no means fit for use in civilised countries; to make it so, it has to undergo many processes: these we shall attempt to describe very briefly. The needle, at the stage we have arrived at, is so soft that it can be bent between the fingers as easily as a piece of lead of the same diameter. They therefore require to be hardened. Previous to the hardening, the "soft-straightening" is to be gone through. This operation is meant to restore the straightness of each needle, lost by the repeated processes which it has gone through, as "pointing," "stamping," &c. The "soft-straightening" is simple. The operative sits at a bench having a flat surface. Placing the needles parallel to one another on this, he presses a convex piece of iron on each of the needles, rolling it over and over, until it is straightened. So quickly is the operation effected, that a good workman may straighten upwards of three thousand needles in an hour. The straightened needles are then hardened by being heated to redness in an oven or furnace, and suddenly plunged into cold water or oil. This makes them so brittle that they can be broken as easily as glass. They require, therefore, to be "tempered." This is effected by placing them on a hot plate, and moving them about so as to present each needle in succession to the action of the plate. As soon as they have all acquired a particular colour, they are removed. When cold, they are then beautifully elastic. As they are, however, slightly distorted by the action of the heat, each needle is straightened by giving it a tiny blow with a tiny hammer on a small steel anvil. This process is necessarily tedious. It is called the "hard-straightening."

The needles, though now properly tempered, are still rough and unpolished on their surface: to obviate this, and make them bright, is the next of the series of operations. The process is termed the "scouring." A strip of canvass is laid on the table, and an immense number of needles are placed on this, all parallel to one another; a pretty large allowance of soft soap, sweet oil, and powdered stone found in the neighbourhood of Redditch, is then placed over them, and the whole tightly wrapped and corded up into a shape as seen in figure 10. A considerable number of these bundles being prepared, they are placed beneath a moving table of wood, working to and fro in a wooden bed. The needles by this means are rubbed one against another, until, in process of time, they are smoothed and partly polished on their surface. After being subjected to the action of this machine, the rolls are untied, and the needles washed; they are then replaced in the canvass, and tied up with a fresh supply of soft soap, oil, and emery, and subjected to the action of the scouring machine. This is repeated several times, till they are perfectly smooth. After being washed for the last time, the needles are placed among some dry sawdust, and worked to and fro in a peculiarly-shaped copper tray till they are all perfectly dry. At this stage a very curious operation is observable: the needles being mixed up with the saw-dust, it becomes a matter of importance to separate them with rapidity; this is effected in a manner as simple as it is effectual. The tray in which the needles and saw-dust are placed tapers up to an edge, which has no margin, thus affording a place over which matters can pass without obstruction. The workman moving the tray rather rapidly up and down, causes the needles and saw-dust to approach the edge: the saw-dust being lightest, flies off, the needles remain; but such is the dexterity of the workman, that, although the needles are seen glancing half over the edge, still it is an exceedingly rare occurrence for one to pass completely over: thus in less time than we have taken to write the above half-dozen lines, the workman can separate thousands of needles from their attendant saw-dust. As may be supposed, the needles from this rough proceeding are lying in all imaginable positions. To make them parallel to one another is the next operation. This is easily effected by placing them in an oblong tin tray, and giving it a peculiar shake in a remarkably short space of time some thousands are parallelised. But, although they are parallel to one another, still they are wrongly situated for subsequent operations—the head of one may be next to the point of another; it is necessary that the heads of all should lie one way, the points another. To attempt to do this by singling out each individual needle, would be a hopeless task where millions have to be operated upon. By a very simple contrivance—we may say machine, for it saves labour—the operation is effected most rapidly. A small piece of linen rag is wrapped round the forefinger of the operative, and, placing a few thousands of the parallelised needles before her on the table, she passes the covered finger along one side of the heap, the finger of the other hand on the other side; the needles having their points at one side stick into the linen rag; these are placed by themselves. In this way all the needles with their heads lying one way are left by themselves.

The next operation is "drilling" the eyes. From the nature of the operation of "punching," the holes are rather rough and uneven: it is to remove this, and to countersink the holes, so that the sharp edges may be taken off, that the operation of drilling is gone through. As the needles by this time are hard, they have to be softened by the application of heat, so that the drill may not be spoiled by the hard metal. For this purpose a number of needles are placed on a bar of iron, with their heads projecting over the edge a short distance: these are then applied to a red-hot bar, which reduces the temper of the needles, causing the head to assume a beautifully blue colour: this process is called the "blueing." A number of the blued needles are next taken by the driller—generally a little girl—and placed behind a flat steel bar, with their heads projecting slightly above its upper edge. The operative sits exactly in front of a little drilling-lathe, in which a small drill is placed, and made to revolve rapidly. The needles are brought one by one before the point of the drill: the drill not only cleans out the eye, making it internally smooth, but it also countersinks the outer edge of each. Some idea of the extreme nicety of the operation may be obtained, when it is remembered that the variation of a hair's breadth in the presenting of the eye of the needle to the point of the drill would result in the complete spoiling of the article; yet such is the amazing rapidity with which the drilling proceeds, that a dozen will be drilled in as many seconds: in fact, it is difficult to believe on first witnessing the operation, that the needles are really drilled.

The needles are then taken to the polishing-room, where they are beautifully polished by being held to the periphery of revolving wheels, covered with buff leather. The needles are taken up in a dozen or so at a time, and first held by the points and the upper ends, then by the heads and the pointed ends: the whole surface of each needle is thus rapidly polished. They are next counted and put up in little blue papers, twenty-five in each, labelled, and tied up in bundles for sale. We have thus briefly traced the manufacture of a needle from its rough state to its final condition. As an instance of the many processes through which a needle of the best quality goes, we here append a list of them:—

Number of processes through which a best needle goes from the commencement of its manufacture.

1. wire received; 2. weighed; 3. gauged; 4. cut; 5. rubbed; 6. counted; 7. pointed at first end; 8. washed; 9. cut back; 10. pointed at last end; 11. examined; 12. counted; 13. washed; 14 weighed; 15. annealed; 16. stamped; 17. pressed; 18. spitted; 19. filed; 20. broken; 21. heads filed; 22. oil burnt off; 23. soft-straightened; 24. evened; 25. counted; 26. hardened; 27. evened; 28. strapped; 29. tempered; 30. weighed; 31. examined; 32. picked for crooks; 33. hard-straightened; 34. counted; 35. scoured with 7 emeries, washed and evened between each; 36. washed and dried; 37. weighed; 38. evened; 39. headed; 40. weighed; 41. ground (at *points*); 42. weighed; 43. scoured again with 1 more emery, and glazed; 44. weighed; 45. washed and dried; 46. weighed; 47. evened; 48. headed; 49. picked for waste and broken points, flecked, and crooked; 50. weighed by count; 51. set; 52. examined; 53. weighed for drillers; 54. blued; 55. drilled; 56. rubbed; 57. weighed from drilling; 58. examined; 59. rounded by finishing; 60. finished once; 61. rubbed; 62. finished again; 63. rubbed; 64. examined; 65. counted in 25's; 66. papered; 67. labelled; 68. tied up; 69. collected; 70. packed up.

FREEMAN ROE AND HANSON'S FOUNTAIN AND HYDRAULIC RAM.

There are many interesting and elegant objects which "lend enchantment to the view," within the Crystal Palace; and none more so than the various beautiful fountains which we discover in different parts of the nave and transept. While Osler's exquisitely finished crystal fountain—occupying the very central spot of the transept—takes the lead in these elegant appendages, the neighbouring fountain of Messrs. Roe and Hanson, with its seventeen jets, which may be varied at pleasure, gives a charm to the spot which it occupies, on the north of the site of the Royal dais, which will be, if possible, more eagerly sought after in the hot days which we may hope to experience in the present month.

This fountain, with the rim of the large basin, is of iron; the basin being 18 feet in diameter. Three other basins are seen rising one above another, the whole being surmounted by the stand pipe, which is furnished with several jets, as the dome, the convolvulus, wheatsheaf, &c. Of the central basins, the lower one is 4 feet 10 inches in diameter, and the upper one 12 inches.

In the large basin is the model of a *Victoria regia* lily, made to the scale of 1½ inch to the foot, having the leaves, flowers, and buds complete: on one of the leaves stands the model of a boy holding a flag in his right hand, with "God save the Queen" inscribed thereon. In the full-blown flowers water gushes out to form the petals; and around the large ground basin are seventeen variable jets, which render this one of the most interesting objects visible in the transept.

The waste water from this fountain is made use of for the purpose of driving an improved hydraulic ram, exhibited by the same firm, a little to the south of their large basin. It has a fall of 30 inches, and throws up water to the height of about 16 feet—the action of the ram being visible to spectators. In mountain districts especially, these rams may be advantageously introduced for raising water for the supply of houses, for the irrigation of lands inconveniently situated as regards water, and for many other purposes where it is desirable to dispense with additional labour.

LITERATURE.

THE EXPOSITION of 1851, &c. By CHARLES BABBAGE, Esq. 8vo. Pp. 231. Murray.

This is a work illustrative of the unparalelled Exhibition, and its unparalelled Crystal Palace repository, and treats not only the immediate subject comprehensively and scientifically, but also discusses, in no forbearing temper, the conduct of Government and the evils of party in other respects. The fame of Mr. Babbage, as a transcendent mathematician, is too well known to need "exposition" (as he prefers to use that French word instead of the usual English "Exhibition"); and his unfortunate differences with Government concerning his calculating machines, and disputes with several of his contemporaries in the pursuit of science, are also too familiar to the public to justify more than a passing reference to them. Suffice it, therefore, to say, that his introductory diatribe, generally, upon English management (Pref. vi. vii.); apology for personalities (viii.); political censures (x. 15, and elsewhere); statement of the ministerial neglect of his extraordinary analytical inventions; declamation against the Royal Society, the Astronomer Royal, and the Rev. Mr. Sheepshanks; eulogium upon Sir James South; argument in favour of entirely secular education; essay on the press; and stringent remarks on the abuse of titular honours and pecuniary rewards where but poorly deserved, while science was discouraged and its chief ornaments were almost despised, though mostly topics of much public interest, may be dismissed with bare enumeration in a notice which we would rather confine to the direct illustration of the actual Exhibition and its prospective results.

The philosophical mind and great intelligence of the writer are displayed, for our purpose, much more satisfactorily in his views of the principles of interchange, and of the rules by which judges and jurors ought to be guided; and his statistical facts and reasoning upon them, and their presence or absence in as far as the conduct of the Exhibition has been carried, and its future management and effects, are implicated. The grand principle enunciated upon the inquiry into the interchange of commodities, and the errors which have heretofore beset that difficult question, is, that "*the free and unlimited exchange of commodities between nations contributes to the advantage and the wealth of all;* that this benefit arises from no sacrifice of one nation for the profit of another; and that the germ of the productive powers of man is by these means, without any increased labour, largely augmented throughout the world; that this increment is won partly by the suppression of ignorance and fraud, and partly by the united effects of industry, of skill, and of science, in compelling Nature to minister to the wants of man."

The tendency of the World's Fair to extend and cultivate these principles and relations is, consequently, highly applauded by Mr. Babbage; but he disapproves of some of the measures adopted for establishing them, and especially the rejection by the Commissioners of the proposal to mark the prices of the articles exhibited, which he considers to be the leading fault in the whole scheme. Upon this most practical point he observes:—

This consequence of the absence of price is injurious both to art and to artists: it occasionally removes from the field of competition the best judges of real merit. It is true that in several professions a certain delicacy respecting money matters exists which is wanting in others. Medical men and artists are peculiarly subject to its influence; but it is not reported of any lawyer that he ever refused a fee; and it is recorded of some Secretary of the Admiralty, that he claimed *a quarter of a year's war salary*, on account of two days' interruption of peace by the combat of Algiers.

§ Another result of prices not being marked upon objects is, that the public are unable to form any just estimate of their commercial value; consequently, no proper public opinion arises to assist the juries in their decisions. This is a matter of considerable importance: the duty of a juror at an exposition is quite different from that of a juror in a legal question. It is the business of the industrial juror to avail himself of the knowledge and the observations of all around him. Much of what he thus hears he may be able himself to verify by examination or experiment, and thus public opinion will be more matured, and the decisions of the juries have greater weight.

§ Many of the qualities of the articles exhibited can only be ascertained by use, or even by their destruction. In such cases a single sample would often be purchased if it had its price affixed to it.

Another class, small indeed in number, but important from its functions, suffers the greatest inconvenience from the absence of price. Those engaged in studying the commercial and economical relations of various manufactures, either for the gratification of their own tastes or for the instruction of the public, are entirely deprived of the most important element of their reasonings.

If *every article* had its price affixed, many relations would strike the eye of an experienced observer which might lead him to further inquiries, and probably to the most interesting results. But it is quite impossible for him to write to any considerable portion of 15,000 expositors for their list of prices, or even to go round and ask for it in the Building itself. Price in many cases offers at once a verification of the truth of other statements. Thus, to a person conversant with the subjects, the low *price* of an article might prove that it had been manufactured in some mode entirely different from that usually practised. This would lead to an examination of it, in order to discover the improved process. The *price* of an article compared with its weight might prove that the metal of which it is made *could not* be genuine. The *price* of a woven fabric, added to a knowledge of its breadth and substance, even without its weight, might in many cases effectually disprove the statement of its being entirely made of wool, or hair, or flax, or silk, as the case might be.

The exchange of commodities between those to whom such exchanges may be desirable, being the great and ultimate object of the Exposition, every circumstance that can give publicity to the things exhibited should be most carefully attended to. The price in money is the *most important element* in every bargain; to omit it, is not less absurd than to represent a tragedy without its hero, or to paint a portrait without a nose.

It commits a double error; for it withholds the only test by which the comparative value of things can be known, and it puts aside the greatest of all interests, that of the consumer, in order to favour a small and particular class—the middle-men.

The composition of that commission must be most extraordinary, where an error so contrary to the principles and so fatal to the objects of the Exposition, could have been committed. It is not too late to apply at least a partial remedy to the evil, and it is scarcely credible that those with whom it rests can remain unconscious of the mistake into which they have been led.

The style and feelings of the author may be gathered from this extract, as well as his cosmopolitan manner of looking round upon the collaterals which are linked, however slightly, with his main argument, which, in this case, is to show, that, by their rules on this matter, the Commissioners "violate the very foundations of those principles on which the whole advantage of the Exposition rests."

Leaving this topic, *i. e.* of the utility, yet largely practicable, of affixing prices and even of facilitating sales, which is also recommended, we can only refer the 15,000 parties most interested in the adjudication of the prizes still retained to the Chapter on Juries, which is full of sound sense and instruction:—

A clear statement of the principles on which each jury is to award prizes should be placed before them. These principles ought to be well discussed, and in that discussion manufacturers should be invited to take a part.

The first object of the jury should be to lay down rules by which these principles are to be carried out. Each class of the subjects to be rewarded will have its own rules. They will generally be few in number, and capable of being expressed in few words: some of these are suggested below, but merely by way of example.

One of the most general rules will indicate the means by which the jury can ascertain the fact, that the material of the manufacture under consideration is truly the substance it is represented to be. For instance, some woven fabric is examined, professing to be made either entirely of wool or wholly of flax. It may be quite true that experienced manufacturers and dealers are able to detect any adulteration of either material by admixture with the other. But statements of facts made on authority, never possess the same weight with the public as those which are accompanied by information enabling any individual among that public to verify the fact for himself. The form of the fibre as shown by the microscope is one test. A more simple one is to burn some fibres in the flame of a candle. Every fibre which, when thus treated, produces the smell of burnt feathers, is animal matter of some kind, as wool, silk, horse-hair, &c. The burnt fibres of hemp, flax, cotton, and other vegetable matters, have a totally different scent; a fact of which any one may readily assure himself by making the experiment. It may, perhaps, be necessary in some cases to wash the fabric under examination, lest, in what is termed the "getting up for the market," some animal matter or size might mislead. But the jury ought to be acquainted with all such difficulties, and they should state the method they took for investigating them.

The microscope is of great use in the detection of adulterations in most vegetable substances.

Every object produced is subject to certain defects, and possessed of certain excellences: these should be clearly enumerated. Whenever such statements are expressed by numbers, the information will be more satisfactory. Thus, in cutting tools, as applied to various metals, it is very important that the angle at which the tool is applied should be stated: it is also necessary to state the angle which the edge of the tool receiving the shaving cut off makes with the surface cut. The velocity of the tool in cutting should be stated, also the names of the fluids, if any, used in cutting.

The durability of woven fabrics, as well as of a great variety of other manufactured articles, is a most essential quality, on which, combined with the price, their chief value to the customer depends. It is very desirable that the jury should find satisfactory means of testing this most important character, which is not discernible even by the most curious and instructed spectator.

The knowledge of the weight required for tearing asunder any woven fabric, as a ribbon, a staylace, tape, &c., together with the breaking weight of their individual threads, and the number of these threads in an inch, may in some cases be very valuable, especially in coarse articles, such as sail-cloth, sacking, &c. In other cases, the articles may be submitted to twenty or thirty washings and dryings, during which it may repeatedly be examined. The greatest change will most frequently occur on the first washing, which removes the dressing.

In many articles the durability of different parts varies considerably. In some cases one part will wear out, if replaced, many times before the remainder of the article is at all injured by use. In all such cases the jury should adopt such rules as the following:—Examine the durability of each part, and also the difficulty and the expense of replacing it when injured. Examine, also, for the same purpose, what parts are most exposed to injury or destruction by accident. Examine, also, the relative expense of putting the article in a working state when first purchased and brought home. These rules will be best understood by an illustration. Let us suppose a jury to be examining the relative merits of several cottage stoves for cooking. Of course, the first inquiry will be as to which admits of the best performance of the operations of boiling, stewing, roasting, broiling, baking, supply of hot water, ironing, &c. The cost of the fuel must not only be given, but also its weight, because the price of fuel varies in different localities. The capability of using different sorts of fuel in the several stoves, and the amount of fuel so consumed for its equivalent of coal, should also be stated. These and other comparative inquiries having been made, the durability of that part of the stove which is subjected to the direct action of the burning fuel must be examined. It will be made either of iron or of earthenware; and the relative merit of the various stoves will, as far as this point is concerned, consist in the facility and economy with which such parts can be removed, and the corresponding new parts be purchased and replaced in their proper position. It is always desirable for the consumer, that the vendors of such articles should keep a stock of the parts liable to wear out, and that the latter should undertake to replace them at a fixed price. Those parts of the stove which project so as to be liable to accidental blows, and those which are from their more constant use much exposed to accident, as the hinges and the latches of doors, should then be examined. These, if of cast iron or other brittle material, and constituting part of the substance of the door, should be sufficiently strong to resist fracture: if they are attached to it by rivets or otherwise, they will be lighter and stronger when made of wrought iron. The last inquiry is into the expense of fixing the stove for use. It may be set in brickwork, within the chimney, in which case it will require a bricklayer and a large mass of materials in the shape of bricks and mortar, and possibly of stone. Or it may stand on its own base containing its own ash-pit, and by means of a small iron pipe the smoke may be conveyed into a flue. In this case almost any workman with hammer and chisel and a small quantity of mortar or cement can fix it ready for use. Again, the stop-cock for the water cistern may be either hard-soldered, riveted, or screwed in. If the latter, it can easily be unscrewed or re-ground when necessary. The same remark applies to the leaden supply-pipe; it may be connected by soldering, or by a union joint. In the former case these parts will require the aid not only of the tinman or coppersmith, but also of the plumber.

The expense of repairing a machine does not in all cases depend on the cost of the part replaced, or even on the actual cost of replacing that part alone. It often happened in the earlier days of locomotive engines, that the expense of some small reparation necessary to keep the machine in good working order did not amount to ten shillings; whilst the expense of removing and replacing other parts, without which the workman could not get at the defective part, amounted to fifty or eighty shillings, or even to a still larger sum. Thus, facility of getting at all the parts of an engine for the purposes of repair, or even of examination, is one of the advantages which the broad possesses over the narrow gauge.

In many articles exposed to great or sudden force, and to much wear or tear, it is very desirable, that, if any breakage occur, it should happen at that point where the consequences would be the least dangerous to the persons using it, and the reparation of it least expensive.

During a series of experiments made by the author, in 1839, on the Great Western Railway, it was necessary, amongst a variety of other curves, to cause a pen to draw upon long rolls of paper the curve described by the centre of a carriage, projected on the plane of the road. When everything is in proper order, this line ought to be parallel to, and in the middle between, the two rails. But it is well known, that, instead of answering these conditions, it often describes a serpentine curve, arising from that snake-like motion of a train which the carriages acquire by rolling alternately towards each rail, until they are checked by the flanges pressing against it. To accomplish the drawing of the line above mentioned, it was necessary to have depending from the carriage a very stout jointed wooden arm, terminating in an iron shoe with a steel projection. This shoe was, by a powerful spring, pressed close to the rail in the middle point between the two side-wheels of the carriage, and by a communication with the pen the required curve was described. But such an apparatus was exposed to very rough work, and, in fact, was generally broken three or four times during each experimental journey. If the broken part had fallen between the wheel and the rail, it might have caused a serious accident. To prevent this the following precautions were taken:—The wooden arm was strengthened with thin strips of iron, except at one part about an inch long. At this part a small notch was cut with a saw. The lower portion had a strong iron eye fixed into it, which was connected loosely to a hook by a rope passing through a hole in the middle of the carriage. Whenever the apparatus broke, it was always at the notch. The position of the loose rope holding the broken part was such, that the tendency was immediately to drag it into the middle of the road, under the centre of the carriage. This at once removed it from interference with the wheels. The pen describing the curve soon gave notice, by ceasing to move laterally, that the arm was broken; on which one of the assistants immediately took hold of the loose rope, and pulling the broken fragment close up to the bottom of the carriage, prevented the possibility of any further danger.

If each jury were to explain concisely the means employed by them to examine the qualities of each class of objects submitted to them, much valuable information would result. A collection of these rules for the judgment or verification of articles, if reduced into order, and published in a small compass, by a competent person, at the close of the Exposition, would be invaluable to the public. The result would be beneficial to all *honest* tradesmen, and injurious only to the *fraudulent*. Such means, when put into the hands of the public, would soon enable it to distinguish the genuine from the sophisticated articles, and to select those which in point of excellence and durability are best suited to the means or wants of the purchaser. The increased knowledge of the public would be felt by the retail dealers, and would make them more anxious to obtain excellent and durable goods from the manufacturer.

Several of the papers issued by the Commission bear honourable testimony to the sagacity of those who composed them. They treat the persons addressed as reasoning men, explaining to them the results contemplated: thus, whilst offering their own most strenuous exertions, they admit that these would scarcely prove effective without the co-operation of the public in a plan devised for the common advantage of all.

In former days, had there been water-fowl in our parks, some such notice as this would have been placarded:—"Whoever throws stones at, or frightens these birds, shall be prosecuted with the utmost severity of the law." In the present day we read the much more effective address:—"These birds are recommended to the protection of the public." However ragged the coat of the passer-by, his feelings not his fears are addressed, and his pride is gratified by being appointed as it were a temporary trustee for the safety of his feathered friends. The advantage of acting upon this principle is not confined merely to its direct efficiency for its purpose. A still more important benefit remains latent, one which never ought to be lost sight of in the enactment or the administration of laws. It enlists public opinion in favour of law and of order. Thus aiding the prevention, the detection, and the punishment of offenders, it renders the interference of the police far less necessary, and, when called for, more effective.

This principle might, perhaps, be applied with advantage to the admission, under regulations, of certain classes of *skilled* workmen by means of tickets, for a limited number of days.

Most effective assistance might be rendered both to the police and to the attendants at the Exposition by the following plan:—

Allow a certain number of persons, in whom the Executive can repose confidence—generally master manufacturers or employers—the privilege of recommending a small number of their best and most regular workmen or assistants, to whom should be granted tickets of admission, subject to the following conditions:—

1. Tickets of admission shall be granted for periods of from three to any greater number of days. Some tickets being for the first three days of each week, or otherwise, as may be convenient.
2. They shall either be gratuitous or obtainable by a small payment.
3. Each ticket-holder shall wear the ticket by a string from the button of his coat, or as may be arranged.
4. He shall, when required by the police or attendants, assist in any duty they may desire for the safety or general convenience of the expositors.
5. Whenever he observes any irregularity, or has reason to believe that thieves or improper persons have obtained admission, he is to inform the nearest policeman.
6. Whenever he observes any machine or any object exhibited to be out of order, or in danger of being injured, or its parts misplaced, he is to communicate the fact to the nearest attendant, who will refer him to the proper superintendent of that department. He will explain the defect he has pointed out; and, if asked by the superintendent, he is to put it in order, or suggest to him some other person then present who may be better able to complete the reparation.
7. Each master should be required to pledge his word that he will only recommend trustworthy persons. Each workman admitted might simply be required to give his word of honour that he would assist.

These regulations ought to be printed and stuck up in various parts of the Building.

It would, indeed, be desirable to have a certain number of boards placed in the most public parts of the Exposition, on which should be fixed and properly classified all rules and other information useful to the public. Also notices as to prices and hours of visiting the Exposition might from time to time be affixed. Each board ought also to have a plan of the ground-floor and galleries of the Building, on which the names of the different subjects and countries occupying the various parts might be readily ascertained by the visitors.

A history of the British Association prefaces a history of the Exhibition, and Mr. Babbage contends—

That, if the views of those who originally organised the British Association had been supported both from within and from without, in the manner which so important a project in the history of science deserved, the Exhibition of 1851 would have found itself led, as it would naturally have been, by the science of the country, prepared by long experience on a smaller scale, yet under very various circumstances, to guide with some reasonable prospect of success that gigantic undertaking, and to elicit from it the many invaluable services it might be expected to render to civilisation.

HOW TO SEE THE EXHIBITION IN FOUR VISITS. By W. BLANCHARD JERROLD. Visit I. Bradbury and Evans.

This little work will be found a more entertaining companion than the Official Catalogue, to which, however, reference must be made for the names and addresses of inventors and exhibitors. Keeping in view the almost overwhelming multiplicity of articles exhibited, any comparatively brief work descriptive of the Exhibition must be little more than a catalogue enumeration; but Mr. Jerrold, in the first of his visits, has certainly overcome this difficulty adroitly, by relieving his guide with reflective halts at certain desirable points of observation. We quote a specimen, the view being from the north-west corner.

Having arrived at this point, the visitor may well pause to notice the four colossal pieces of statuary which mark the four central corners of the main avenues. He may also notice from this point the huge glass chandelier in the gallery immediately above the statue of Falkland; the organ in the gallery above the southern entrance, and the general perspective effect of the galleries, with the huge draperies of all kinds and colours hanging from them in every direction. From this point he may hear faintly the gigantic organs which are in the Foreign and British departments, bells of huge proportions tolling lowly in the vast space, and the faint tinkling of grand pianos. So gigantic is the scale of the Building, that the loudest shout Lablache could raise from the transept would not be heard at either extremity of the Building. The great elm in the northern division of the transept gives, more than any other proportion to be noted in the Palace, an idea of the colossal size of the Building which contains it. At this point the visitor will generally find crowds of bewildered spectators looking about them, and endeavouring to imbibe from the splendid confusion a general idea of the great whole. To master an exhibition of dimensions and variety so unparalleled is no easy task to the visitor who is introduced to it, without some straightforward and comprehensive guide; and endeavouring to place ourselves in this position of guide, we have grouped the varied contents into two great divisions, the foreign and the British: and these divisions respectively into three distinct parts, consisting of the main avenue, the southern section, and the northern section. By adopting this division, the details, so far as the general visitor is concerned, are easily and effectually comprehended and enjoyed.

CELEBRATED TRIALS CONNECTED with the UPPER CLASSES of SOCIETY, in the relations of Private Life. By PETER BURKE, Esq., of the Inner Temple, Barrister-at-Law. Benning and Co., and Ollivier.

This may be regarded as a second series of a work which experienced, a few years ago, a very favourable reception, and bore the similar title of "Celebrated Trials connected with the Aristocracy, in the relations of Private Life." The difference between the two volumes is, that the latter extends the subject further, and gives those trials which regard not exactly titled personages, but parties who have moved in the higher ranks. Interesting as the former volume was, the new one surpasses it in the extraordinary and romantic character of the incidents and events narrated. Few novels or tales of fiction are of a more strange and startling nature than this collection of trials, teeming with marvels and horrors. Mr. Burke has made the book a readable and a safe one for all persons. He has carefully weeded each trial of legal technicality and prosiness, and has excluded all matter of indelicate or improper tendency. Among the cases included, we would point out as particularly interesting those of Arden of Feversham, Major Strangwayes, Misiress Rawlins, the Marquis Paleotti, Miss Knox of Prehen, Major Campbell, and the Clavell will. Some well-known trials, such as those of the Wakefields, Fauntleroy, and Rush, are also well reported here: and if what Mr. Burke states in his preface be correct, those trialsi ncrease the value of the book, from the strange difficulty there exists of finding any record of trials of moment after the period of their taking place.

These volumes, both the first and the second series, are books that ought to be read and thought over, as affording singular examples of the perversions and wanderings of the human mind. Even the trivial incidents we here and there find in them are passing strange; such, for instance, as an attorney, hanged for murder, praying on the scaffold in Greek to show his classical knowledge; and the Marquis Paleotti, also executed for murder, requesting of the sheriff that he might be allowed to die alone, and not come in contact on the gibbet with criminals of the vulgar class.

SACRED INCIDENTS. By PSYCHOLOGIST. 2 vols. Hampden and Co.

This is only a very small portion of the title-page to these volumes, in which it is declared that the said "Sacred Incidents" are "doctrinally considered and poetically described;" and such poetical description or doctrinal consideration is dignified with the character of "The Harmony subsisting between the Book of Revelation and the volume of Nature; setting forth the operations of the Antagonistic Powers of Good and Evil, as portrayed in Creation, in the History of Mankind, in Redemption, and the Resurrection." The two volumes carry us through the history of the world from the creation to the Israelites crossing the Red Sea; which portion of history is told in verse, accompanied with doctrinal prose. But this is not all. The poem is designed for recitation—for public recitation, illustrated with "two hundred and fifty dioramic representations," now in progress, and intended, we believe, for part of the Grand Exposition of the present year, not in, but near the Crystal Palace. It will be seen, therefore, that "Psychologist" is a bold experimentalist. If, however, his success is to be measured by the value of his poetry, we fear that his adventure has not over much promise; indeed, we have seldom perused verses less meritorious in all respects. Pity, with so much ambition, that there should be so little power, and yet so much self-delusion.

HAMON and CATOR; or, the Two Races: a Tale. Simpkin.

This is a book. Traces of painful authorship are impressed on its every line. The writer, too, has a style distinguishable for his own. It is forcible, terse, emotional, descriptive—but not fluent. It is concise; and, where necessary, effect is produced by repetition, not amplification. The story is one of stirring interest, though, cast as it is in antediluvian period, unlikely to be popular. The two races are Cain and Seth, and the narrator of the tale is supposed to be Cain himself, who is driven through descending moral abysses, to contemplate and lament the results of the first murder. He himself was forgiven, and so also is the murderer in the present tale; but society is rendered unsafe through his escape, and at length is compelled to hunt down the habitual homicide as a wild beast. The moral, we suppose, is designed to be in favour of capital punishment. We should much like to see a story equally powerful written on the opposite side of the question. The effect, we believe, would be incomparably finer; and, had the present author given a different termination to his argument, we believe that this fine work (for such it is, and a work of true art, too) would have commanded more than a common degree of attention.

SOMETHING on RUSKINISM; with a Vestibule in Rhyme. By AN ARCHITECT. Hastings.

The author says that he shall be satisfied if the profession say of these pages, in the words of *Touchstone*, "that they are at any rate so-so." We concur in the opinion he desires—they are *very* so-so.

FLOREAT ECCLESIA. By Miss ROSA RAINE. John Hughes.

This is "a manual of church poesy." The authoress is already well known as a writer of religious verse, and the present *brochure* will sustain her reputation.

MIXED POEMS, by a CLERGYMAN. Hope and Co.

By the title, the author seems to imply that these poems are both secular and religious. A few are neatly versified, but none of them rise above mediocrity.

THE EXILE, and other Poems. By CHRISTIANA E. PUGH. Hope.

The fair writer has yet to learn the art of versification.

ETHEL LEA. A story by ANNA KING. Parker.

A child's book of no especial merit; in fact a very inferior production, in point of composition, and of small interest in the story. The moral, however, is well intended, and so fa justifies its publication.

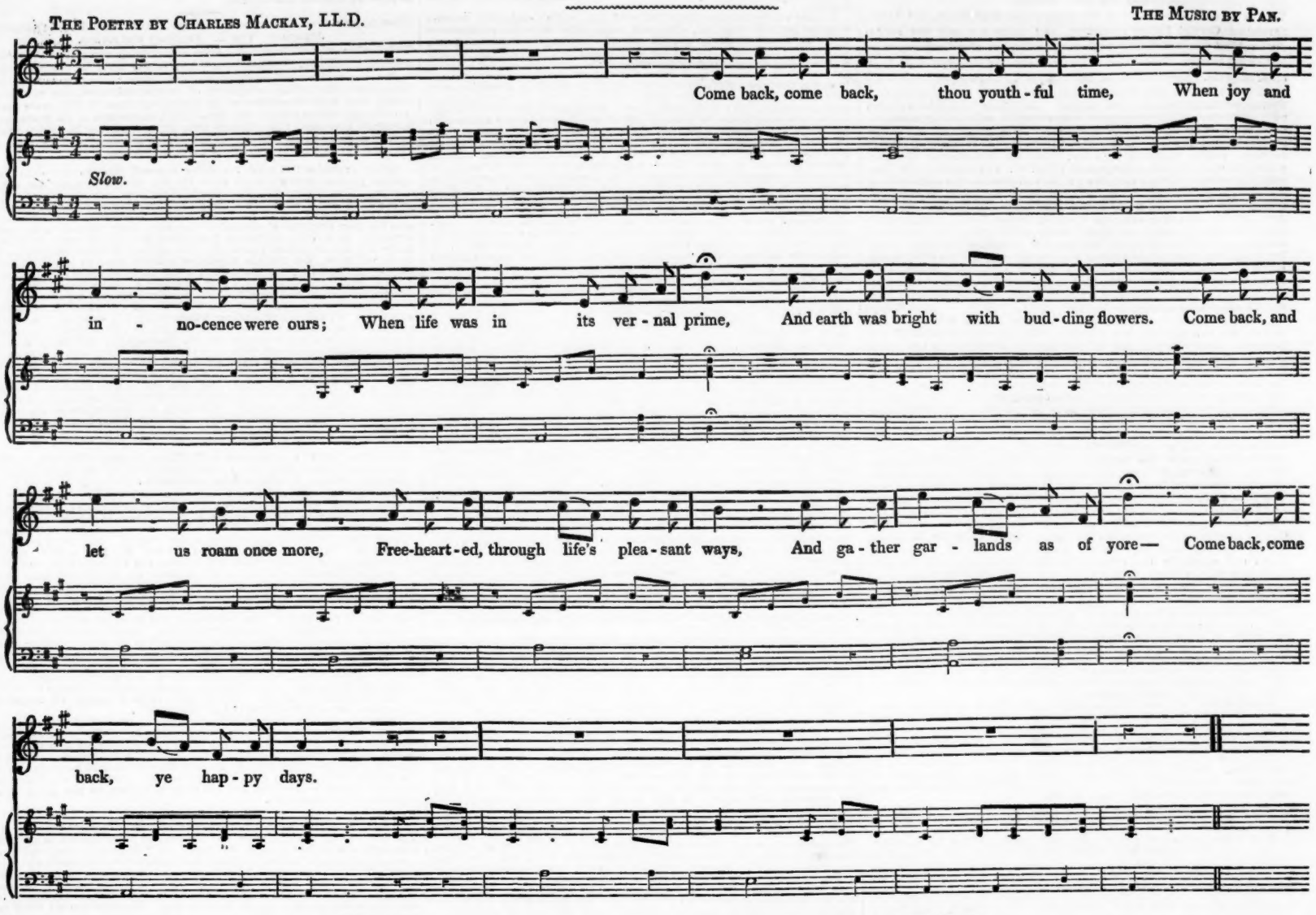
DUNHILL'S MODEL, IN THE EXHIBITION, OF A PROPOSED SUBURBAN CATTLE MARKET.

At the present time every assistance which can be given towards abolishing the frightful nuisances of Cattle and Meat Markets and Slaughter-houses from the great metropolis should be looked on with favour by the masses of the people, who would benefit by so great a boon being granted to them. Mr. Thomas Dunhill, C.E., who was examined before the Parliamentary Committee on this subject in 1847, and again by the Royal Commission in 1850, exhibits in the north-west gallery a large and beautiful model of a Cattle Market, Abattoirs, Carcase Market, Calf and Pig-markets, Melting-houses, Stallage, together with a Horse-market and Cattle-infirmary, so as to comprise in one grand scheme a plan which shall rid London of almost all the abominable nuisances with which many of the most populous districts are polluted.

The site for this purpose, which the projector points out as most likely to answer the purpose, is in Copenhagen-fields, near to the Great Northern Railway. This situation he finds to be at an elevation above the Thames of about 200 feet; and therefore may be considered, so far as regards the layers for the cattle, a healthy spot, and yet not inconveniently distant from the centre of London.

The principal or cattle market he proposes to extend to 23 acres; and, by two principal roadways, with numerous cross-ways, every stall and pen could be readily approached. This large area would, according to Mr. Dunhill's calculation, accommodate 6000 head of oxen and 40,000 sheep; and the whole space proposed to be enclosed, for all the purposes comprehended within this useful scheme, is equal to 65 acres.

COME BACK, YE HAPPY DAYS.

THE POETRY BY CHARLES MACKAY, LL.D. THE MUSIC BY PAN.

Come back, come back, thou youth-ful time, When joy and
Slow.
in - no-cence were ours; When life was in its ver-nal prime, And earth was bright with bud-ding flowers. Come back, and
let us roam once more, Free-heart-ed, through life's plea-sant ways, And ga-ther gar - lands as of yore— Come back, come
back, ye hap-py days.

SECOND VERSE.

Come back, come back! 'twas pleasant then
To cherish faith in love and truth;
When nothing in dispraise of men
Had sour'd the temper of our youth.
Come back, and let us still believe
The gorgeous dream Romance displays,
Nor trust the tale that men deceive—
Come back, come back, ye happy days.

THIRD VERSE.

Come back, oh, freshness of the past,
When every face seem'd fair and kind;
When sunward every eye was cast,
And all the shadows fell behind.
Come back—oh, yes! true hearts can turn
Their own Decembers into Mays;
The secret be it ours to learn—
Come back, come back, ye happy days.

TO CORRESPONDENTS.

W V, Oldcastle—Apply to Sherwoods, publishers, Paternostar-row
E T H, Gloucester—Commission some friend in London to employ a broker to invest th money
H W J, and F T M—We have not room for the lines
A CONSTANT READER, Liverpool—See Rolandi's book on Fencing
H H H—Apply to Mr. Hullah, St. Martin's Hall, Long-acre: there is no free school for singing in London. Mr. Balfe's address is Her Majesty's Theatre
LECTOR CONSTANS—The address of Lord Duncan, M.P., is
J S, Islington—The birth-day of Alfred the Great was celebrated at Wantage, Berks, Oct. 25, 1849
J M, Hadham—The Act of Parliament may be had through any bookseller, or the Queen's Printer, London
W N, Crewkerne, Somerset—Declined
T V M—See a forthcoming Volume of the NATIONAL ILLUSTRATED LIBRARY
LUNES INTELIGIBLE—"To a Young Lady on her Birthday"
W P D—Apply for the Nankeen at Hewett's china dépôt, Leadenhall-street
BRITANNIA BRIDGE—A fine model of this triumph of mechanical skill is in the western portion of the Nave of the Great Exhibition Building
AN OLD SUBSCRIBER—Address, "Mr Blewitt, Sec. Literary Fund, Great Russell-street, Bloomsbury"
S T H, Daventry—The "Marriage-à-la-mode" Pictures at Marlborough House are by Hogarth
S S, Stamford; A G, Leamington; and A R K, are thanked; but we have not room fo he diagrams
Q Q, St Neot's—"Language of Flowers," published at 85, Fleet-street
VETULUS, Edgeware-road—See Low's "Charities of London"
JOHANNES should follow the advice already given
VERAX is mistaken; there are two blocks, and no re-publication
R J T, Northampton—We have not room for the lines
H J, Dalston—The poet Moore resides in Wiltshire
J M, Hoxton—We are not aware of any prize having been offered for the discovery of Perpetual Motion by artificial means
L H, Ightham, may purchase geological specimens of Mr Tennant, Strand
Miss H, Derby—The daily newspapers will best supply the list
J L H—Dyer's Poems may be had of a dealer in second-hand books
L E L—See "Logic for the Million," just published
C B, Tottenham-court-road—Messrs Day and Haghe, lithographers, Gate-street, Lincoln's-inn-fields
J R S, Belfast, and MONENSIS had better apply to a patent agent
J H, Manchester—Davidson's "System of Short-hand"
R W F—See the "Emigrant's Guide to Australia," just published by Messrs Chambers, Edinburgh
J S, Brighton—We had not room for the Illustration
VIATOR is correct: neither of the attempts was made on Sunday
EDIENSIS—What you propose to do would be illegal
A TWO YEAR OLD SUBSCRIBER—Apply to the Secretary of the Society
A MANX SUBSCRIBER—Apostle Spoons were so called from the figures of the Twelve Apostles being chased or carved on the tops of the handles; a set of such spoons being twelve
R W, Dursley—We have already engraved the watering-place
I M is thanked; but we have not room for the diagram
ATHERSTONE—Apply to Mr Weale, publisher, 59, High Holborn
E T, Finsbury—The Royal Agricultural Society's Show will, this year, be held at Windsor
A M, Caher—We are not in possession of the information sought
ASTRAN, Oxford—See Professor Baden Powell's paper in our Journal for
A READER, Edinburgh—We cannot inform you
W C L, Carlisle—See the paper on Costumes, in Chambers' "Information for the People"
W R—The Great Exhibition is announced to continue open until the end of September
E H I, Chelsea—A cabman is only required by law to convey in his cab two persons
F P B M, near Dorchester—Deacon's, in Walbrook, probably
G W, Shiffnal, Salop—The beech-tree is not, as asserted, a non-conductor of lightning
W T, Bridgenorth, is thanked; though we could not avail ourselves of his suggestion
J D M, Chatham—We regret that we have not room
O F—See the History of Wood Engraving, in Vol. IV. of the ILLUSTRATED LONDON NEWS
J C—The Report may be had at the office of the Society
ODE—All the back Numbers of the ILLUSTRATED LONDON NEWS are kept in print
R B M, Tenby—We have not space at present
W W W, Grantham—Another notice is requisite
MAKOCKERHEIR—We have not room for the lines
OLIVER SWIFT—The population of Ireland was, in 1805, according to Mr Newenham's estimate, 5,395,456
W T, Toronto, Canada, is thanked; though we could not avail ourselves of his Sketch
MISS MERRILIES—See Mr Smee's "Elements of Electro-Biology; or, the Voltaic Mechanism of Man"
S S B, Haverhill—It is not illegal to carry an air-gun; its being employed in a few instances as the instrument of covert and cowardly revenge has given rise to the above popular error
N A T, Durham—A print from Maclise's portrait of Charles Dickens may be had of Chapman and Hall, Piccadilly. An Exhibition Catalogue may be had, by order of any bookseller
H A, Aberborne—We have no faith in the Lottery
WAGNER—Some account of the notorious Dr Graham will be found in the "Anecdote Library;" and in Mr Britton's "Autobiography," lately published
J P B—The clock tower of the New Houses of Parliament is that nearest Westminster-bridge
ONE FOR OLDEN SPORTS—Walker's "Manly Exercises," new edition
J B—Inglis's account of the Channel Islands is the fullest; but there are guide-books of more recent date
R D, Ely—See the treatise on "Photography," published by Knight, Foster-lane, Cheapside
H M'MASTER, Dublin—Guides to London are now cheap and numerous
J M F—Low's "Charities of London;" an excellent work. The "School of Phrenology" is in King William-street, Strand
W M S H, Kincardine—See Murray's "Handbook of North Germany"
J J, Monte Video, is thanked; but we have already engraved the port
J G B, Diss—Davidson's "System of Short-hand"
J M N, Buxton—We have not room for the Illustration
ALPHA, Roxburghshire—"Because other men with their two forefingers point, and make horns at him"—See "Brand's Popular Antiquities, vol. ii, page 126
J S B, Gloucester—To visit Paris, a passport is necessary; it may be obtained at free of expense. The journey from London to Paris, *viâ* Brighton, Newhaven, and Dieppe, occupies
E O, Manchester, is thanked for his correction. The line, "Peter sat by the celestial gate," is not from "Don Juan," but is the first line of the first stanza of "The Vision of Judgment"
A B, Hanley—The address of Mr Robert Stephenson, MP, is
E N R, Lewes—Apply, with the coins, to Mr Webster, 17, Great Russell-street, Covent-garden
A SUBSCRIBER, Glasgow, is recommended to apply to the person to whom the Essay was addressed
D, Derby—See the new edition of Cruchley's "Picture of London," and Jerrold's "How to See the Exhibition in Four Visits"
K R S—We do not interfere in disputes at card-playing
APOLLO—Mr M Farquhar Tupper resides at Aldbury, Guildford, Surrey
A CONSTANT READER, Leamington—The Illustration in question has not appeared in our Journal
N N is thanked; the drawing is that of a ribbon fish
J S, Charter-house—We have not room for the charade
ELIZABETH, St. Helier's—Address Edwardes-square, Kensington
RARA AVIS, Newhaven—A work on Taxidermy, published by Van Voorst, 1, Paternoster-row
W V H, Grantham—The Rev. Dr. Cumming preaches at
S B B, Hull—Address, Princess' Theatre, Oxford-street
BARBARA, Dorset; and LAOCOÖN—The line "When Greek join'd Greek, then was the tug of war," is from Nat Lee's play of "Alexander the Great"
Adopts—See "Walker's Manly Exercises," for the rules of bowls
ALUMNUS—It was at the preliminary meeting, held at Osborne, June 30, 1849, that Prince Albert proposed that the Great Exhibition should be extended to the industry of all nations; but it was at the banquet given at the Mansion-house by Lord Mayor Farncomb, March 20, 1850, that Prince Albert first publicly explained the noble purpose of the Exhibition. This meeting proved of the most important service in the earliest stage of the project; and in any recognition of those public men who have contributed to the success of the Great Exhibition, the patriotic feeling and good sense of Alderman Farncomb, we dare say, will not be overlooked.
A J, Westminster—Certain primers have long had a frontispiece clock face, with moveable hands, to "teach children how to tell the clock;" and large clock faces, to be used in schools, are also made for this purpose. Davidson's "System of Short-hand" is more practical than that described by our correspondent
INQUIRY, Kensington—The line "England, with all thy faults I love thee still," is from Cowper's "Task," book ii., the Time-piece. Lord Byron quotes the line in his "Don Juan"
A CORRESPONDENT—Excellent wax for making flowers may be bought of Mrs. Strickland, Pantheon Bazaar, Oxford-street
CURIOSO, Hartlepool—The brass coin is a one-cash piece, of China, of the Emperor Kien-Long, 1722-35. *Obverse*—Kien-Long (above and below the hole), and Tong-Paou, i.e. current coin of the realm (at the sides of the hole). *Reverse*—Paou-Kurang, i.e. Canton. The silver coin is a part of the Spanish piece of eight
NUMISMATIST, Liverpool—The cost of a pair of florin dies will be about £25; though we are not prepared to say what the Mint florin dies may have cost the country
ANTIQUE—The impressions sent are from two pennies of Edgar (sole Monarch), A.D. 959 to 979
X Z—1. Edward VI. sixpence, York mint, from 9s. 2. Mary's groat before her marriage, from 3s. 3. Apply to Mr Hearne, bookseller, 81, Strand, for the "Numismatic Manual," 1840
I O G, Newport—The half-crown of George II is of no value
AN OLD SUBSCRIBER—Your coin is a screw-dollar of the town of Augsburg. It was the custom in Germany to have the dollars made to unscrew, and to place inside them paintings, carved ivory plates, written prayers, &c. I myself have seen some dollars of Augsburg of that time, containing portraits of various persons in a military dress, among others that of an Imperial Governor of the town, accompanied by a painted representation of the Holy Trinity. If, on comparison with an authenticated portrait of the Prince of Condé, yours should agree, then it would certainly have more historical interest than the screw-dollars have in general
AN OLD SUBSCRIBER—Courtesy always accords the designation of Captain to one who has a navy time held that commission in H M army
E S T—Prince Albert's father was brother of the Duchess of Kent
W R—If the arms and pedigree be already registered, the expense is trifling, not exceeding two guineas
DIANA, Dublin—The correct and usual pronunciation is *ee*
A CONSTANT READER—F and G are first cousins of the half blood
H H F—The subsequent marriage of the parents does not, in England, legitimise the child that has been born out of wedlock
H B—"Barry of ten or and sa. a bend trefié vert," are the arms of Saxony as borne by Prince Albert
WINTOUN SACKVILLE—The Shelleys are a family of great antiquity and high position. They have been settled in Sussex from a remote period. That county was the first place they became established in. Mr Nicholls, of Parliament-street, is the publisher of Mr Long's work, the price of which is 10s 6d
E N T—The arms of Beaumont of Yorkshire are—"Gu. a lion rampt. arg. langued and armed az., within an orle of crescents of the 2d. *Crest:* A bull's head erased, quarterly arg. and gu. *Motto:* Fide sed cui vide." Our correspondent seems to have a fair claim to those heraldic bearings
HOWELL—The simple adoption of the third name, as an additional surname, would legalise the assumption. If a Royal licence were obtained, the cost would be fifty guineas; but without this the assumption is legal
ROUGE DRAGON—If the envelope be sealed with an heraldic device, the party is liable to the tax
OMICRON—Earl Fitzhardinge uses the same arms as belong to the Earldom of Berkeley. The Earl of Derby's are—"Arg. on a bend az. three bucks' heads cabossed, or. *Crest:* On a chapeau gu. turned up erm. an eagle, wings endorsed, feeding on an infant in its nest ppr. swaddled az., banded of the third. *Supporters:* Dexter, a griffin, or; sinister, a buck, also or; both ducally collared and chained az., the buck attired of the last. *Motto:* Sans changer."
A CORRESPONDENT, in answer to H, gives the following information:—The paternal coat of arms of Leonard Troughear was—"A five-pointed star arg. on a field sa." He assumed the name and arms of Holmes from the settlement of his maternal uncle, Thomas Lord Holmes, of whom Leonard Troughear's mother was the eldest sister.
CLERICUS SUB ARTICULIS—We think, at Aberdeen
AN INQUIRER INTO HERALDRY—The arms of Burton, of Falde, co. Stafford, Lindley, &c. Leicester, and Dronfield, co. Derby, are—"As. a fesse between three talbots' heads, erased or. *Crest:* A beacon, arg. burning ppr., standing on a mount vert. *Motto:* LUX vibe." The coat of arms of one person does not apply to another of the same name, unless that other be of the same family
CORNWALL—The arms of Furness are—"Arg. a talbot sejant sa. in chief, three crescents gu. *Crest:* Out of a ducal coronet a lion's paw holding a lance ppr"
M C—*Arms of* Chambers: "Sa. a cross couped erm. between four martlets rising or. *Crest:* Out of a ducal coronet or, a demi-eagle displayed gu., wings or."
M U S, Oxford—Crest of Sanders: "A demi-bull rampt. gu., armed or (charged sometimes with a rose arg. barbed and seeded ppr.)"
T H—The arms of Holman: "Vert, a chev. or between three pheons arg. *Crest:* On a chapeau gu. turned up erm an ostrich's head arg."
HISTORICAL SOCIETY OF PENNSYLVANIA—We would recommend a design to be made, incorporating in one shield such devices as would commemorate the leading incidents in the history of the State. It would be unheraldic to quarter the arms of countries together, and the escutcheon of pretence would be equally against rule
T K R—Arms of Keel: "Per cross crenelée arg. and sa.; in the first quarter a crescent of the second"
A CONSTANT SUBSCRIBER—Arms of Remington: "Barry of twelve arg. and az. Over all, a bend gu. *Crest:* A hand erect, holding a broken tilting spear, all ppr. *Liveries:* White and red"
LEONARDUS—The arms of Hargreaves of Lancashire are—"Quarterly, or, and vert, on a fesse erm., between two stags courant counterchanged, a frot gu." It is not correct for a lady's second husband to impale the first husband's arms
A SUBSCRIBER—Arms of Bowerman—"Erm. on a bend cottised sa., three boars' heads couped or. *Crest:* A goat's head erased or, the horns twisted gold and sa."
P C R—We can find no arms to the name of Charnley
LECTOR HIBERNICUS—Robert le Diable, Duke of Normandy, was father of William the Conqueror. Prince Rupert was nephew of King Charles I, being second son of Frederick Duke of Bavaria, the Elector Palatine, by the Princess Elizabeth of England, sister of that Monarch
AN EXHIBITOR TO THE GREAT EXHIBITION—Arms of Milton: "Per pale az. and gu., an eagle displayed with two heads or, within a bordure engr of the last"
ETIQUETTE—In society, where the regulations of precedence are adhered to, a Baronet's unmarried daughter would go before the married wives of those of inferior position
WILLIAMS—1. Garnett of Lancashire—*Arms:* "Gu. a lion rampant arg., ducally crowned or, within a bordure engr. of the last." The present William Garnett, Esq. of Bleasdale Tower, has had a grant from the Heralds' Office, somewhat differenced, viz. "Gu. a lion rampt arg., ducally crowned or, within a bordure nebulé;" also, "Or a cassion of the last, thereon an eagle displayed with two heads sa." 2. Arms of Ellison: "Gu. a chev. or, between three eagles' heads erased arg. *Crest:* An eagle's head erased or."
GUTCH—A Marquise's designation is "Most Honourable"

London: Printed and Published at the Office, 198, Strand, in the Parish of S Clement Danes, in the County of Middlesex, by WILLIAM LITTLE, 198, Strand, aforesaid.—SATURDAY, JULY 6, 1851.—SUPPLEMENT.